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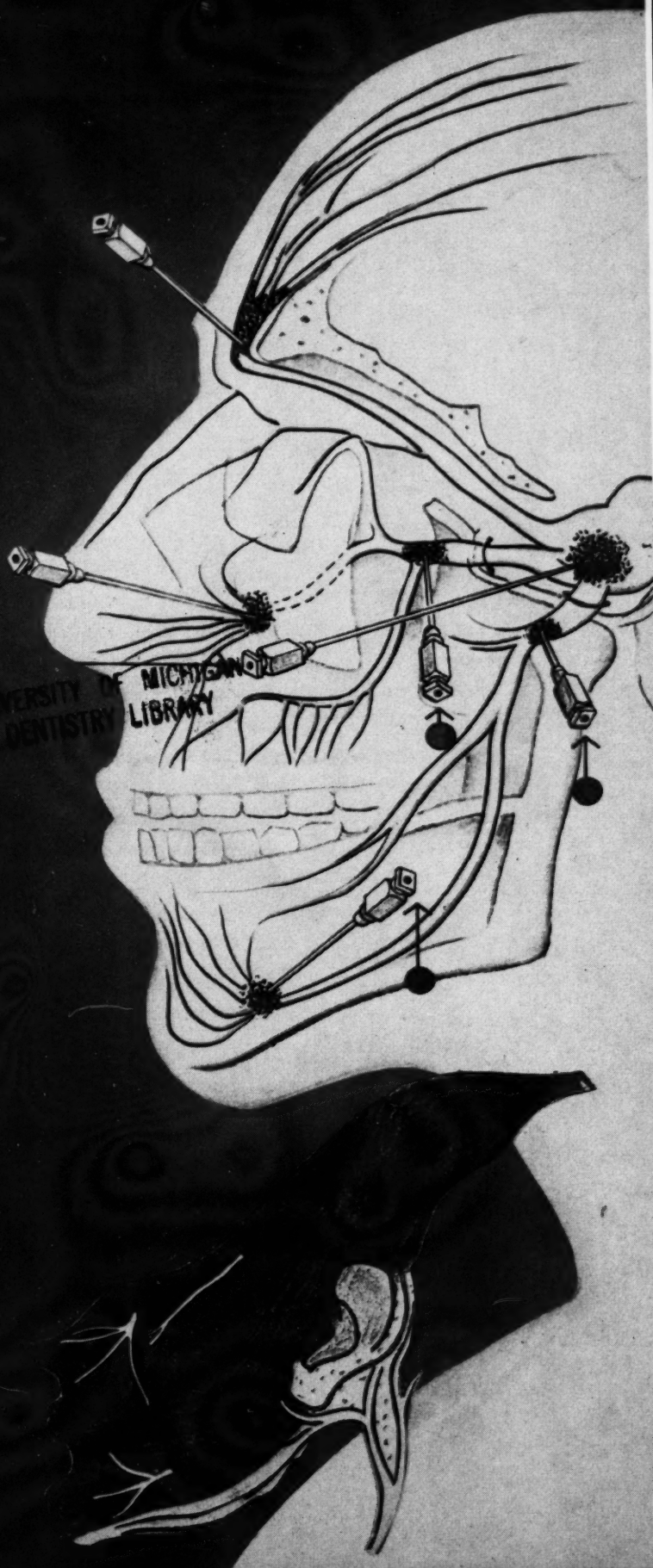
February 1961

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ARNOLD P. FRIEDMAN, M.D., Physician-in-Charge of the Montefiore Hospital Headache Unit, New York City, and his collaborators, CHARLES A. CARTON, M.D., and ASAO HIRANO, M.D., who are associated with the Divisions of Neurology and Neurosurgery at the Montefiore Hospital, present an article, *FACIAL PAIN*, which was first published in *Postgraduate Medicine* in June 1960.

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The CCC TECHNIQUE

in Full Mouth Reconstruction

LEONARD I. LINKOW, D.D.S., Kew Gardens Hills, L.I., New York

DIGEST

This article is a step-by-step description of a rehabilitation technique evolved by the author and successfully adapted by him in his own practice. The procedure, which is valuable for duplication of prepared teeth, accurate transfer of copings, and immediate revelation of parallelism, is designated as the CCC (compound, copper band, coping) technique.

Rationale of Procedure

Wide experience in full mouth rehabilitation, using the many different methods available, demonstrates that simple theories and uncomplicated methods are efficient and will produce excellent results. Extra-oral registrations and articulations may be confusing to the operator; in most cases the occlusal plane can be re-established by using the remaining teeth in the patient's mouth. Raising the bite by use of elongated crowns is not usually advised. If the bite is to be opened, a bite-plane is used. In re-establishing the occlusal plane crowns are not constructed at a higher occlusal level than the patient's highest remaining tooth.

Tooth Replacement Should be Prompt—Extracted teeth should be replaced as soon as possible to prevent the development of an occlusal irregularity; if this is not possible the irregularity should be corrected by judicious grinding or by orthodontic treatment before starting the bridge construction.¹

Related Factors

The condition and position of the abutment teeth must be considered. It

is generally agreed that when a fixed bridge is placed on a tipped posterior abutment tooth the bridge causes undue leverage in a forward direction, with the strain on the anterior tooth. The force of the bite being applied in a vertical direction is received unfavorably by the tipped tooth, causing an excessive thrust anteriorly. This excessive force is sometimes better withstood by two anterior abutment castings soldered together, rather than one.

Tipped Teeth as Abutments—According to Tylman² teeth tipped beyond 24 degrees should not, as a rule, be used for bridge abutments, for in this situation it will be found that the vertical stresses on the bridge will not be transmitted in the direction of the long axis of the tooth which will result in crushing the periodontal membrane and breaking down the tissue on the mesial aspect of the tooth.

Theory Challenged—In the author's opinion, if breakdown and tissue damage occur when tipped teeth are used as abutments it would seem that even more breakdown would result from leaving the tipped tooth undisturbed. By splinting the tipped tooth and keeping it immobile by closing the spaces breakdown cannot occur as rapidly.

Additional Important Factor—The condition of the periodontal structures and alveolar bone is also a factor of great importance. Naturally, if the bone support of all the abutment teeth is good, the prognosis can be regarded

as excellent. The supporting bone, however, can be broken down to such an extent that it would appear clinically unwise to attempt to splint the teeth.

Conservation of Devitalized Teeth—Devitalized teeth with long-existing root canal fillings are viewed as favorably as vital teeth. Teeth with previous apicoectomies or teeth that require root resections are considered valuable for successful bridge abutments. Frequently, especially in the lower molar areas, the mesial or distal root of a molar may be removed and root canal therapy completed on the remaining root in order to preserve it for use as a posterior bridge abutment. A molar tooth with one complete root is as strong as any one-rooted tooth and in many cases much stronger.

Size of Interproximal Embrasures—Some operators prefer large embrasures so that there is no tissue strangulation by pressure upon normal interproximal gingival tissue.³ In the author's opinion, the size of the embrasure should be governed by the degree of tissue tolerance and the ability of the tissue to adapt itself interproximally.

Important Considerations in Successful Technique

1) All the preparations should be left without line angles. They should be cylindrical in shape.

2) All preparations should be tapered to a satisfactory degree both buccolingually and mesiolingually.

3) The finishing line in all preparations should be made as high under the gingival tissue as possible.

4) Under no circumstances should the technician extend crown margins beyond finishing lines.

5) The preparations must all be

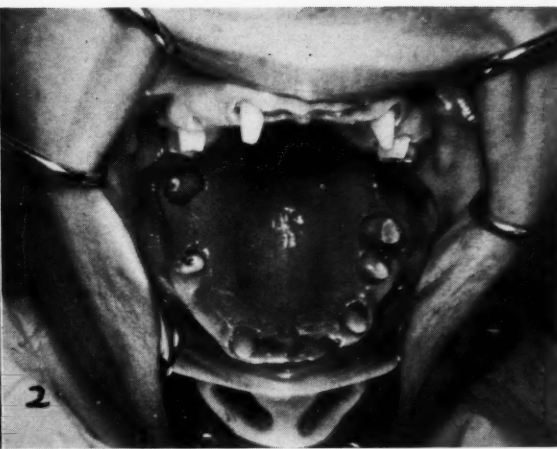
¹Noyes, Harold J.: Factors Responsible for Occlusal Pattern in Function and Retention, Chicago, Association of Orthodontics, 1936.

²Tylman, Stanley D.: Crown and Bridge Prostheses, St. Louis, The C. V. Mosby Company, 1947, p. 20.

³Schweitzer, Jerome M.: Oral Rehabilitation, St. Louis, The C. V. Mosby Company, 1951, p. 1025.



1.
Shows abutments prepared on both sides.

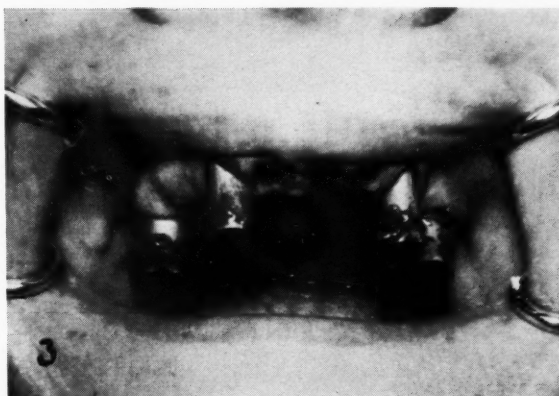


2.
The cylindrical tapered shape of the preparations is shown.

parallel to such a fine degree that the entire bridge can be placed in position with *complete passiveness* in relation to the abutments. This passive contact determines the degree of success with the technique. Do not hesitate, therefore, to grind away tooth structure of one or more teeth in order to bring them definitely into parallel relationship with the rest of the arch.

6) A well fitted copper band is the best tissue retractor available. Techniques employing impression creams have a number of disadvantages:

- a) They hide undercuts.
- b) Silk tissue retractors temporarily injure gingival tissue.



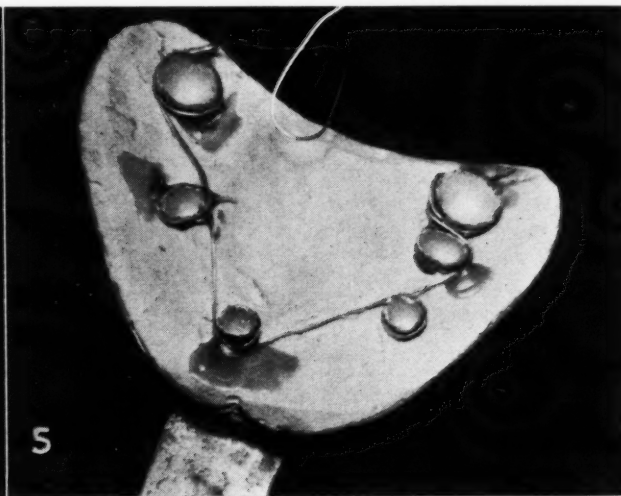
3.
All the compound band impressions are in place over prepared abutments.

c) A minimum of two visits is required because the tissue must recede before the technique can be continued.

7) After removing copper band impressions from prepared abutment teeth the finishing line seen on the compound should never end on the edges of the band; there should al-

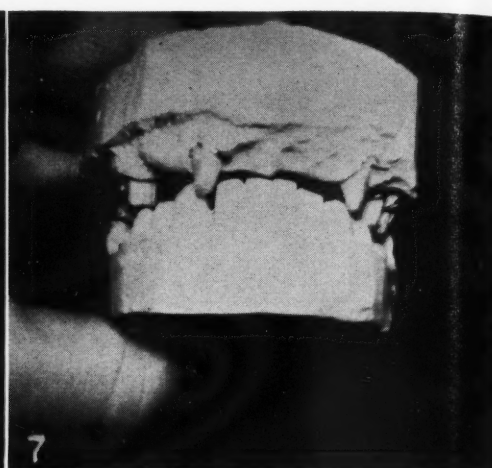
4.
Shows the compound bands in the plaster index after removal from the mouth.

5.
Shows 24-gauge "dead soft" wire wrapped around each copper band to make continuous contact for copper plating.

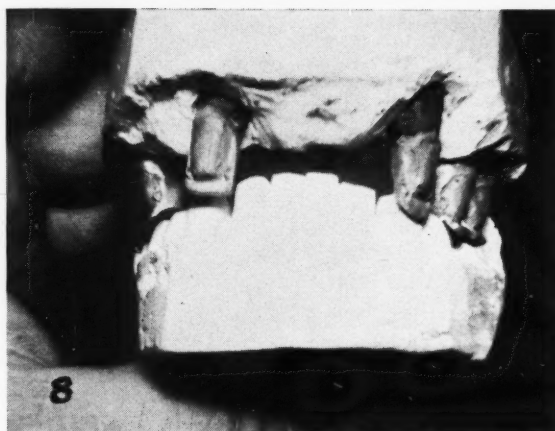




6.
Preformed rubber molds are shown in place at opening of each copper-plated compound impression immediately before pouring the Mello's metal.



7.
Model with copper-plated dies is shown in place. From this mold the case can be completed if necessary.



8.
Abutment castings are shown on model before being fitted in molds for final index.

ways be an apron of compound beyond the finishing line.

8) Completion of the bridge should never be delayed. Five visits should provide ample time for completion.

9) Six anterior teeth can be prepared for porcelain jackets or veneer crowns, including impressions and bites, in one visit. If the finished crowns are desired for the second visit, however, a problem presents. The step in the procedure where error is most apt to be made is in *transferring the dies to the bites or plaster impressions*. No matter how carefully the dies are placed in bites, and no matter how carefully the bites are taken, experience has shown that it is in this operation that error usually occurs. This is proved by the fact that when veneer crowns or jackets are tried they are usually in *traumatic occlusion* and must be ground down.

CCC Technique Applied in Oral Rehabilitation

The following steps comprise the entire procedure for a complete bridge:

1) The alginate impression is taken on the side of the mouth where the abutments are to be prepared making

sure the impression extends to a few teeth on the other half of the mouth.

2) The abutments are all prepared (Figs. 1 and 2).

3) The compound impressions are taken; after checking each impression the bands are replaced on the prepared abutments (Fig. 3). The compound bands are ligated with each other with 24-gauge dead soft brass wire while in position in the mouth.

4) A full mouth plaster impression is taken with the impression bands in place (Fig. 4).

5) An alginate impression is taken of the opposing jaw.

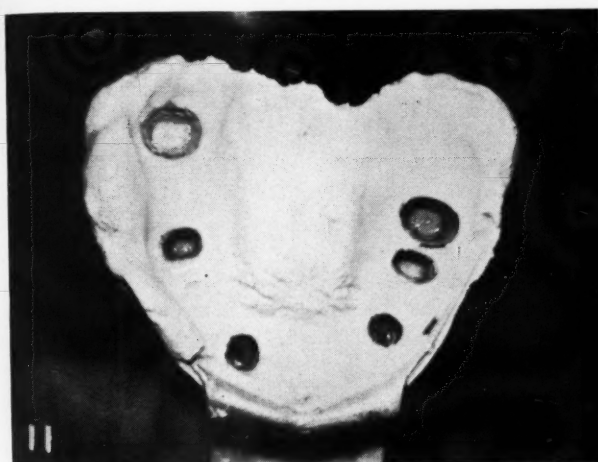
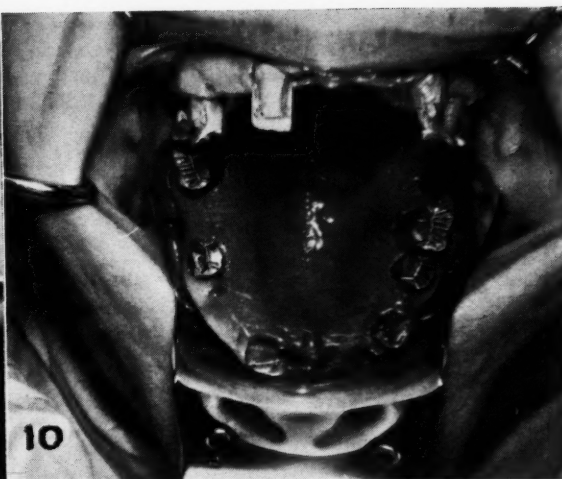
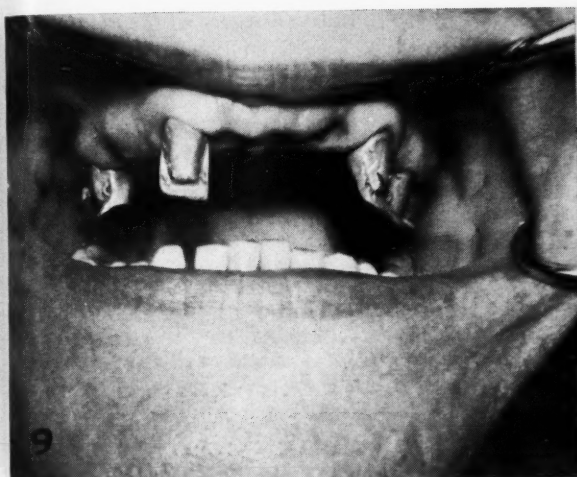
6) Where most of the teeth are missing it is advisable to take a wax bite also to facilitate articulation of the two full mouth models.

7) The copper bands also act as transfer copings and therefore should not be removed from the full mouth plaster impression; the entire tray is immersed in the copper sulfate solu-

tion. Before doing so the following steps should be taken:

a) If the copper bands were not ligated while in the mouth, 24-gauge "dead soft" brass wire is wound around each copper band in a continuous fashion so that all the wire makes contact as shown in Figure 5. A thin layer of casting wax is wrapped around the gingival portion of each band and extended 2 millimeters beyond the band to facilitate removal of excess copper. The end of the brass wire is attached to the anode holder of the copper-plating machine. The whole mass is allowed to remain in the bath.

b) To prevent the aluminum tray from being copper plated either of two measures may be taken: (1) separating medium may be used inside the aluminum tray before taking the plaster impression so that the tray can be separated from the plaster and need not be included in the copper sulfate



9.
Castings are in place in the mouth ready for plaster index.

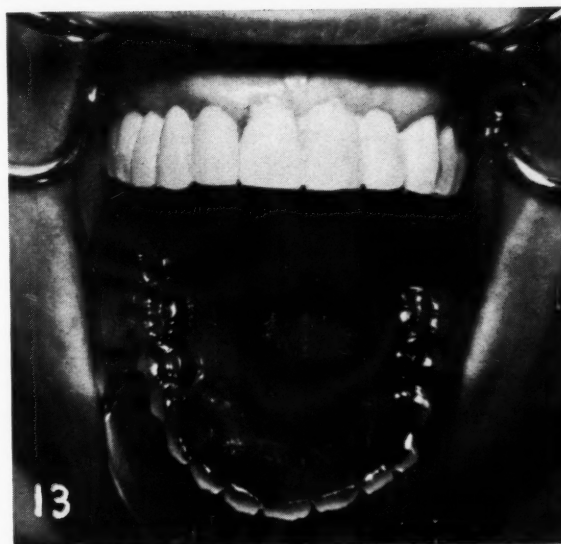
10.
The span of the castings occlusally is shown.

11.
Full mouth plaster index is shown with the gold castings in their proper place after removal from the mouth.

12.
Castings immediately before soldering to pontics.

bath. (2) If there is fear of breaking the plaster impression, cover the entire tray with carding wax or baseplate wax. The wax is removed after the bands are copper plated so that the aluminum tray will not be damaged.

c) Mellot's metal is poured into the copper-plated compound bands, using the preformed rubber molds (Figs. 6 and 7).



13.
Shows completed bridge.

8) A temporary acrylic bridge is made on the prepared side by placing acrylic powder into teeth areas of the original alginate impression and add-

ing acrylic liquid until the powder is saturated. Replace in the mouth using the few teeth that were included in the alginate impression from the other

side of the mouth as guides for the position of the posterior impression. When hardened the temporary bridge is removed, trimmed, and replaced with zinc oxide-eugenol in the mouth. If this operation is correctly executed the acrylic bridge will not only fit properly at the gingival margin but will duplicate the original teeth so closely that the bridge may be used as a guide for taking the bite on the other side.

9) If the operation described in Step 8 is too difficult the operator can wait for the return of the crowns that were made on the first side of the mouth, grind them into occlusion using the unprepared side as guide, cut down the second side, and use the fitted and ground-in crowns of the first side to provide an accurate bite (Fig.

8). The same compound, copper band, coping technique is employed on the second side.

10) On the second or third office visit all the abutment castings are tried in the mouth (Figs. 9 and 10), a thin bite is taken in wax, and a full mouth plaster index is made to include the entire prepared jaw (Fig. 11). All the castings are soldered to each other, including the new pontics; the bridge is articulated with the original opposing jaw model, and the case is processed (Fig. 12).

11) On the fourth visit the bridge is inserted in the mouth. Experience with the method has shown that the best results are obtained when the technique is completed in three or four office visits.

Advantages of Technique

1) Complicated condyle registrations and complex articulations which may complicate techniques are eliminated. The simpler a technique, the better the results achieved.

2) The position of the dies with relation to the maxilla and mandible are duplicated exactly; the guesswork involved in seating dies in distorted wax bites does not exist.

3) No change in condylar movements occurs, and there is no change in the condyle head because the bite is as close to perfect as possible.

4) Laboratory failure is reduced to a minimum.

5) The compound impressions serve as a direct accurate transfer coping.

71-17 150th Street

Thumb-Sucking

Problem

A girl aged 5½ sucks her thumb so persistently that her lower permanent incisors are displaced. Is a permanent deformity likely to result? What is the psychological significance of the habit?

Discussion

At 5½ years the lower permanent incisors are just erupting. Despite quite marked displacement there may be no permanent deformity. Orthodontists do not view the habit of thumb-sucking in such a serious light as hitherto. They believe that it is rarely the primary cause of a permanent deformity. The important point is that if thumb-sucking is superimposed as a temporary feature on a dentition which is developing normally the tongue will reposition the teeth when the habit ceases.

The Frequency and Persistency of Habit—If the habit is continued for several years and the deformity is marked, it will not be corrected naturally if the lower lip adopts a position between the upper and lower incisors.

Most children will give up the habit by 8 or 10 years of age with a little help and persuasion.

Simple Dental Plate—By insulating the palate the pleasure of sucking is removed. No drastic steps need be taken and a nagging parent makes matters worse.

Emotional Significance

Abnormal Development—A sucking habit may be superimposed by a dentition which is developing abnormally because of inherited jaw form or adverse tongue and lip forces. The sucking habit may exaggerate the deformity and only minor natural improvement occurs when the habit ceases.

Persistent thumb-sucking in a child of school age, to the extent of being responsible for displacement of teeth is an indication of a need to cling to a form of satisfaction which is normal at an earlier stage of development but which should no longer be appropriate.

Anxiety Indicated—Such a failure in emotional development or regres-

sion to an earlier stage of development, is indicative of anxiety which may be due to difficulties within the child (that is, learning problems related to the commencing school situation) or to disturbances of one sort or another in family relationships.

Significance Assessed Before Treatment—It is not only useless to try to stop the symptom forcibly, but it is likely to be positively harmful to future emotional development if its significance is not assessed before treatment is planned. If the thumb-sucking is considered after investigation to have ceased to be significant in itself and to have passed into the realm of "habit," its removal can be facilitated only by the provision of alternative oral satisfactions. But every effort should be made to assess fundamental problems before treating persistent thumb-sucking as a habit of little or no emotional significance.

Adapted from Any Questions, *British Medical Journal* No: 5139:25 (July 4) 1959.

FACIAL PAIN*

ARNOLD P. FRIEDMAN, M.D., CHARLES A. CARTON, M.D.,
and ASAO HIRANO, M.D., New York

DIGEST

Facial pain is a symptom which may be associated with a variety of clinical conditions. The underlying disorder may be anatomic, physiologic, or psychologic. Although methods affording relief have been found, the basic cause and mechanisms producing the pain, in most instances, remain unsolved. To the patient the symptom is disturbing not only because of the discomfort but because of possible unpleasant psychologic connotations. Precise diagnoses and treatment of facial pain usually are difficult because of (1) the extremely complex cranial and cervical innervation, (2) the intricate vascular supply, and (3) the extent to which the emotional state modulates responses to a painful stimulus. This article illustrates three main categories into which facial pain may be grouped as an aid to clinical management.

Categories of Facial Pain

Facial pain may be grouped into three main categories:

- (1) Typical neuralgias, primarily neurogenic
- (2) Atypical neuralgias, primarily vascular and psychogenic
- (3) Facial pain secondary to other extracranial and intracranial causes

This classification is not perfect but permits a rational approach to diagnosis and therapy.

Typical Neuralgias

A typical neuralgia is a paroxysmal, sharp, shooting pain of short duration, with no pain between attacks, occurring within the sensory distribution of one of the cranial nerves. By definition, it is relieved by temporary anesthetization of the sensory area in which it occurs, or permanently by surgical denervation of that area.

Criteria—The following characteristics may be observed:

Distribution of pain . . . Limited in the field of one of the cranial nerves

Character of pain . . . Paroxysmal, sharp, localized

Duration of pain . . . Seconds to minutes

Autonomic nervous system signs . . . None

Precipitation by external stimuli . . .

Yes

Trigger zone . . . Present

Age . . . Older age group

Pharmacology — The following agents may be used:

Vasoconstrictor . . . No relief

Vasodilator . . . Inadequate relief

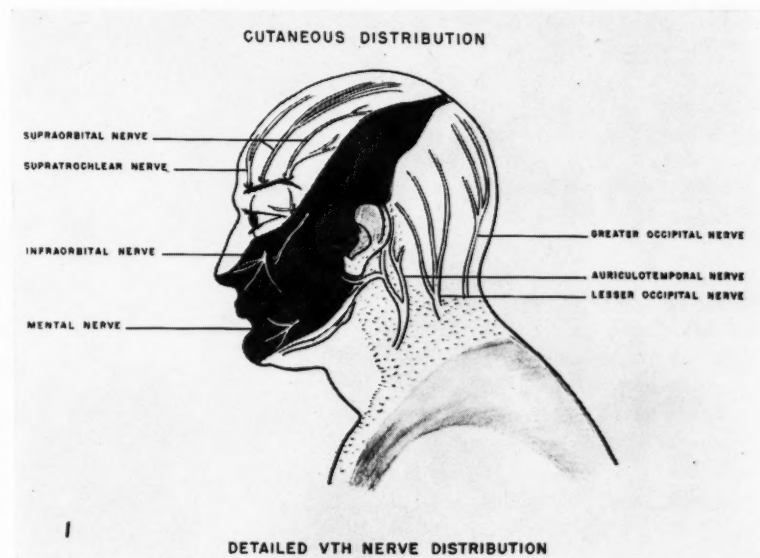
Narcotics . . . Inadequate relief

Other Procedures — Surgical or chemical interruption of cranial nerve may obtain relief.

Personality—Neurotic traits are not prominent in this type of neuralgia.

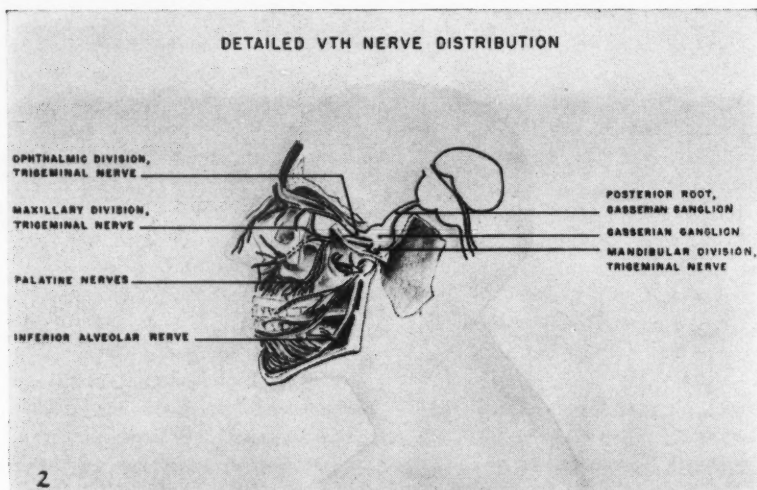
Specific Characteristics of the Typical Neuralgias

Trigeminal Neuralgia—Pain usually occurs in the second and third divisions of the fifth nerve. Less frequently it occurs in the first division. All three divisions may be involved. There may be trigger areas where



1.
Cutaneous distribution of the fifth nerve.

*From Headache Unit and Divisions of Neurology and Neurosurgery, Montefiore Hospital, New York.



stimulation may set off a paroxysm of pain; touch, chewing, or swallowing may act as a trigger mechanism. Neurologic examination yields findings completely within normal limits. Specifically, there are *no* sensory changes in the distribution of the fifth nerve.

Occipital Neuralgia—Paroxysmal pain occurs in the back of the head radiating from the lower part of the neck over the scalp. Pain is limited to the distribution of the lesser and greater occipital nerves.

Glossopharyngeal Neuralgia—Pain usually occurs in the tonsillar area and ear, in the distribution of the glossopharyngeal nerve. It is knifelike, paroxysmal, and often precipitated by yawning and swallowing (liquid and food in contact with appropriate area).

Geniculate Neuralgia—Paroxysmal, stabbing pain occurs deep in the ear. It is not precipitated by swallowing. It may be reproduced by stimulation of the nervus intermedius during surgery.

Nerve Blocks for Diagnosis and Therapy

Diagnostic Blocks—Local anesthetic agents may be used to block branches of the fifth nerve. This may be done peripherally in the skin at trigger points, or at the supraorbital, infraorbital, and mental foramina. Lingual nerve block may relieve attacks of pain in the tongue. More proximally, nerve blocks at the existing foramina from the skull will block

the maxillary and mandibular divisions. Finally, gasserian ganglion block may be accomplished via the

2.

Detailed fifth nerve distribution.

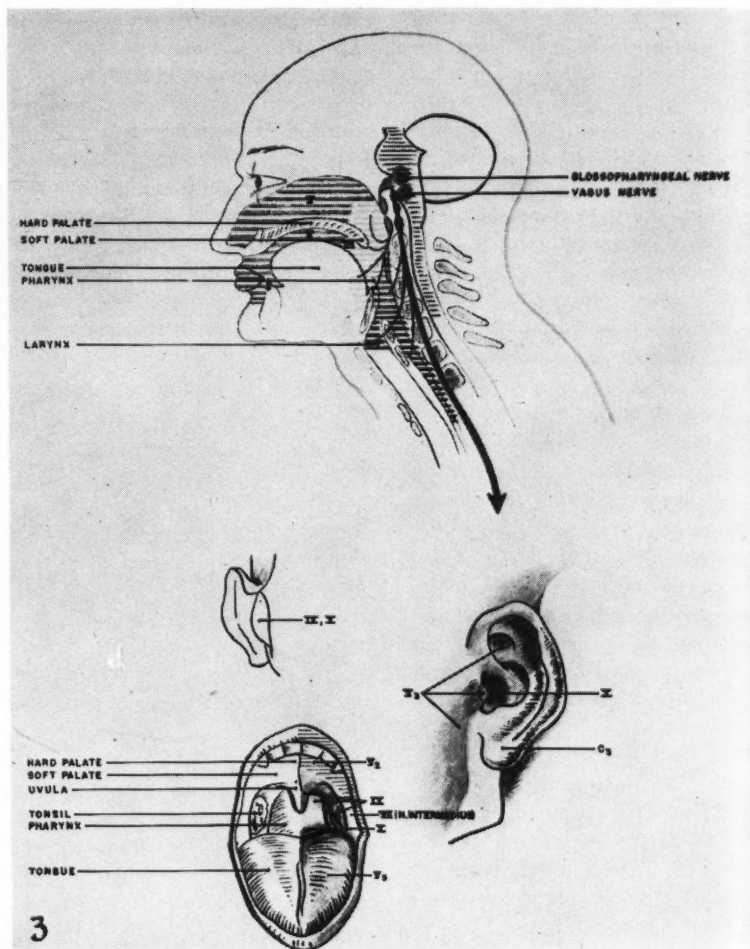
foramen rotundum injection.

Therapeutic Blocks—Permanent interruption of peripheral branches may be accomplished (1) by alcohol injection at the peripheral foramina, (2) into the maxillary and mandibular divisions at the base, and (3) by gasserian ganglion injection. There may be regeneration of fibers with peripheral injection, but not with gasserian ganglion injection. Cocainization of the tonsillar area will relieve the pain of glossopharyngeal neuralgia.

Operative Therapy

Trigeminal Neuralgia—1. Peripheral nerve avulsion or section.

2. Differential or complete section of the posterior root of the gasserian



3.

Sagittal section. Nerve distribution of ear and oropharynx.

ganglion, sparing the motor root.

a. Temporal approach.

b. Posterior fossa approach.

3. Ganglion decompression, or compression. Both temporarily relieve pain, probably dependent on ganglion cell damage.

4. Section of the tract of the descending fifth nerve in the medulla.

Glossopharyngeal Neuralgia—Section of the ninth nerve and upper vagus rootlets intracranially.

Geniculate Neuralgia—Section of the nervus intermedius intracranially.

Occipital Neuralgia—Section of the greater or lesser occipital nerve, or both, extracranially.

Herpes Zoster—Nerve blocks and nerve section do *not* relieve pain. Elevation of skin flap (from periosteum outward) with repositing of flap *may* relieve pain (skin flap must include postherpetic scars).

Atypical Neuralgia

Atypical neuralgias are characterized by attacks of pain in the head, face, and neck which are not well localized and which may occur in paroxysms or be continuous. They frequently are associated with cranial autonomic activity on the side of the pain and often are seen in tense, anxious persons.

Criteria—The following characteristics are noted:

Distribution of pain . . . Does not follow nerve distribution

Character of pain . . . Diffuse, deep-seated, poorly localized, described as pulling, gripping

Duration of pain . . . Hours or days

Autonomic nervous system signs . . . Lacrimation, flushing, nasal congestion

Precipitation by external stimuli . . . No

Trigger zone . . . Absent

Age . . . Younger age group

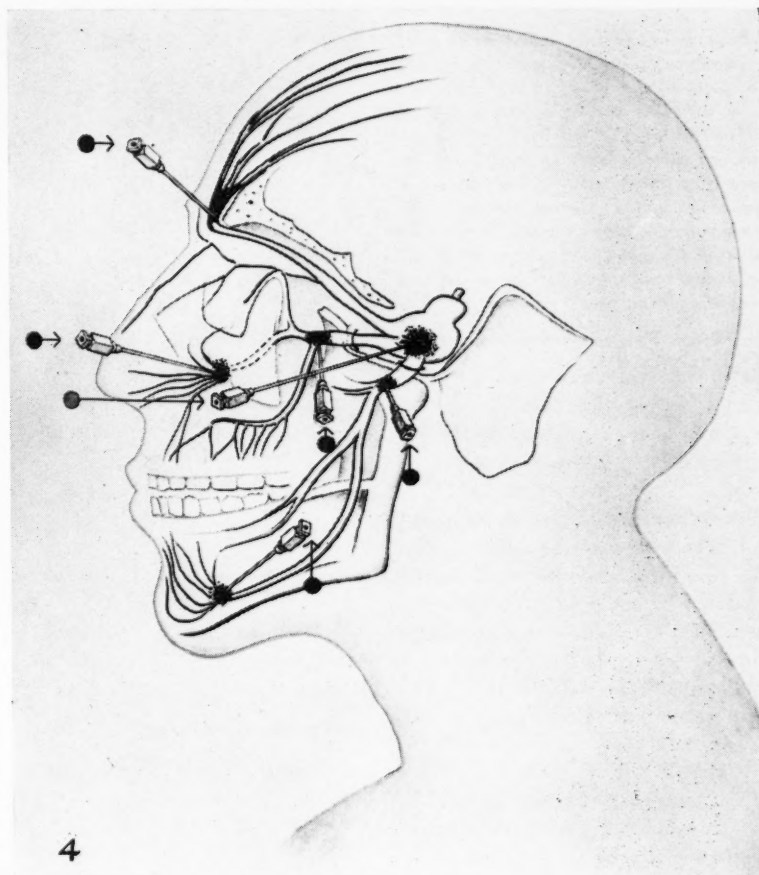
Pharmacology — The following agents may be useful:

Vasoconstrictor . . . Frequent relief

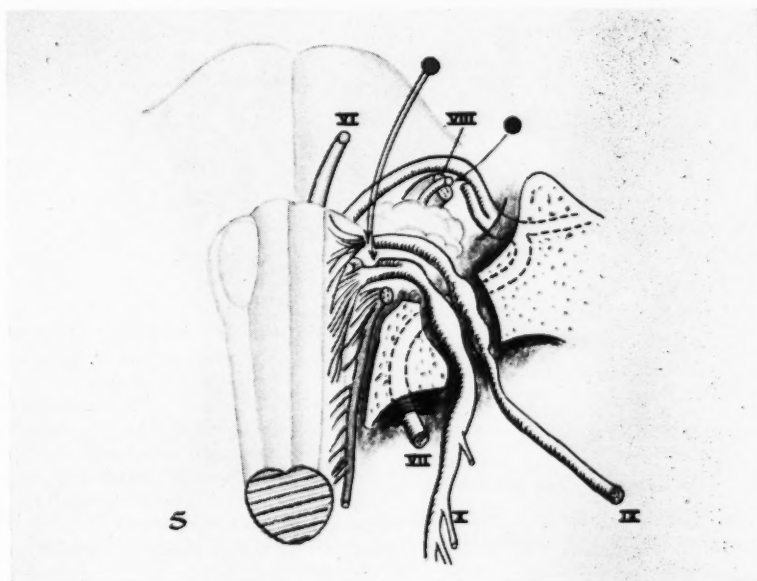
Vasodilator . . . No relief

Narcotics . . . Frequent relief

Other Procedures—Relief by surgi-



4. *Therapeutic blocks.* Permanent interruption of peripheral branches may be accomplished by alcohol injection at the peripheral foramina, into the maxillary and mandibular divisions at the base, and by gasserian ganglion injection. There may be regeneration of fibers with peripheral injection, but not with gasserian ganglion injection. Cocainization of the tonsillar area will relieve the pain of glossopharyngeal neuralgia.



5. Origin of cranial nerves.

6. *Anatomy of cranial arteries. In atypical neuralgias, there are periodic attacks of local dilatation of extracranial vessels in areas mainly supplied by the branches of the external carotid arteries; that is, internal maxillary, superficial temporal. Some terminal branches of the internal carotid artery in the areas of the nose and eye may be dilated. The fact that one artery or set of arteries may be involved suggests a neurogenic origin.*

cal or chemical interruption of cranial nerve does not affect pain.

Personality — Neurotic traits are prominent.

Treatment—Symptomatic

Pharmacotherapy, Specific — The following is a list of the medicaments that may be employed. All of these are available in tablet and suppository forms.

Cafergot®

Ergotamine tartrate plus
caffeine Vasoconstrictor

Cafergot P-B®

Ergotamine tartrate plus
caffeine Vasoconstrictor
1-Belladonna . . . Antispasmodic
Pentobarbital sodium . . Sedative

Wigraine®

Ergotamine tartrate plus
caffeine Vasoconstrictor
Belladonna
alkaloids Antispasmodic
Acetophenetidin Analgesic

Migral®

Ergotamine tartrate plus
caffeine Vasoconstrictor
Belladonna
alkaloids Antispasmodic

Cyclizine

hydrochloride . . . Antiemetic

Pharmacotherapy, Nonspecific —

The following agents, available in tablet form, are used:

Empirin® Compound

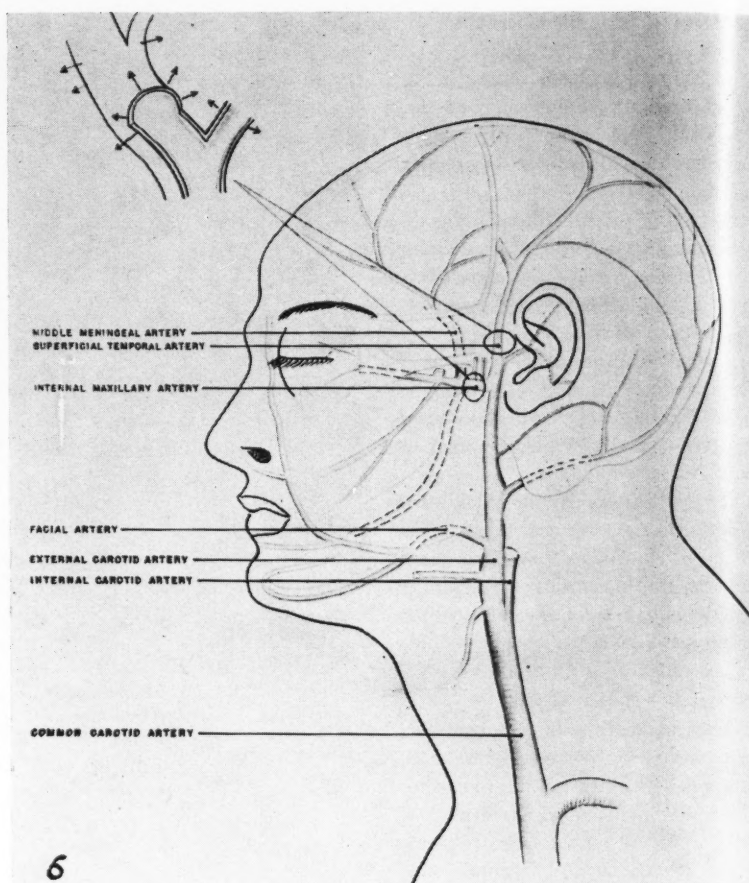
Acetylsalicylic acid . . . Analgesic
Acetophenetidin and
caffeine Sedative

Amytal®

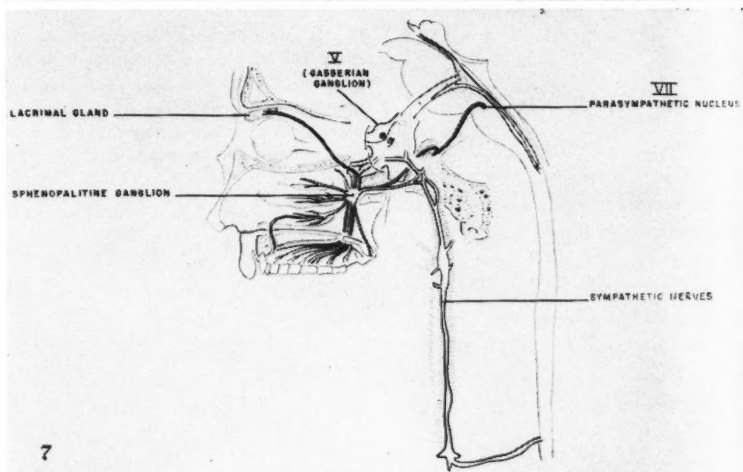
Amobarbital sodium . . . Sedative

Sinutab®

N-acetyl-para-aminophenol
Acetophenetidin Analgesic
Phenyltoloxamine dihydrogen
citrate Tranquilizer



6



7

7 and 8.

Cranial autonomic pathways. Secretory and vasodilator fibers for the glands and mucosa of the nose, soft palate, tonsils, uvula, roof of mouth, upper lip, gingivae, and upper part of the pharynx are carried by fibers from the greater superficial petrosal nerve via the sphenopalatine ganglion.

Secretory fibers for the lacrimal gland are carried by the greater superficial petrosal nerve to the sphenopalatine ganglion, thence via the zygomatic nerve and lacrimal branch of the ophthalmic division of the trigeminal.

Vasoconstrictor fibers are carried by the sympathetic fibers from the carotid plexus via the deep petrosal nerve to the sphenopalatine ganglion.

Sensory supply to the sphenopalatine ganglion is carried by two branches of the maxillary nerve.

Phenylpropanolamine hydrochlorideVasoconstrictor
Codeine PhosphateAnalgesic
Darvon®
Dextro propoxyphene .Analgesic

Treatment—Prophylactic

1. *General Measures*—These include the following:

Avoidance of fatigue and stress.
Adequate hygiene.

Avoidance of specific activities which may precipitate an attack (dietary indiscretions, alcohol).

Elimination of offending allergens; correction of any metabolic defects (rarely significant).

2. *Pharmacotherapy*—The following medication is employed:

Amytal®

Amobarbital sodium . . .Sedative

Belladonal®

1-Belladonna . . .Antispasmodic

PhenobarbitalSedative

Chlor-Trimeton®

ChlorpropenpyridamineAntihistamine

Dilantin®

DiphenylhydantoinAnticonvulsant

Miltown®, Equanil®

MeprobamateTranquilizer

Ultran®

2-p-Chlorophenyl-3-methyl-2,3-butanediolTranquilizer

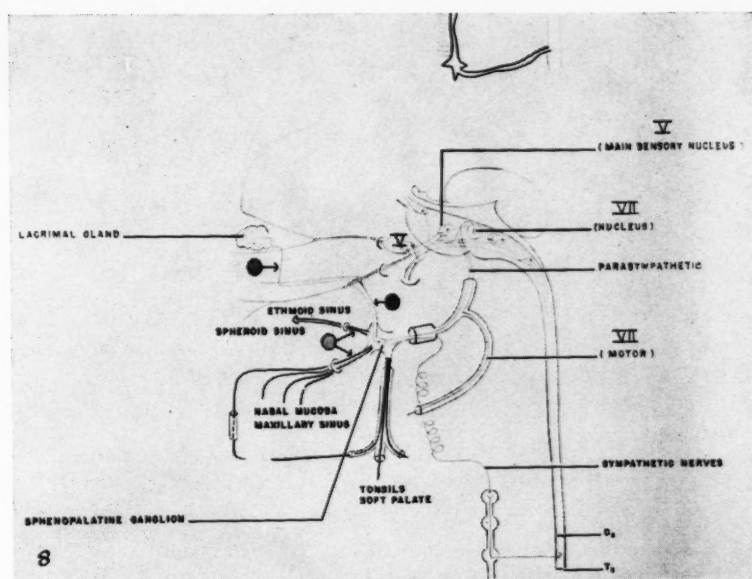
3. *Psychotherapy*—(1) Attempt to give patients understanding and insight into their life situations. (2) Re-education and reorientation with respect to the patient's personal, economic, and social life should be undertaken.

4. *Surgery*—In general, surgical procedures should be avoided.

Facial Pain Secondary to Extracranial and Intracranial Causes

Pain in the face is carried by specific neuroanatomic pathways. Disease entities may affect these pain pathways at one or more levels, and may be considered as involving the following mechanisms and sites:

1. Cerebral (psychogenic)



2. Central (thalamic pain, brain stem, spinal cord)

3. Posterior root

4. Ganglion

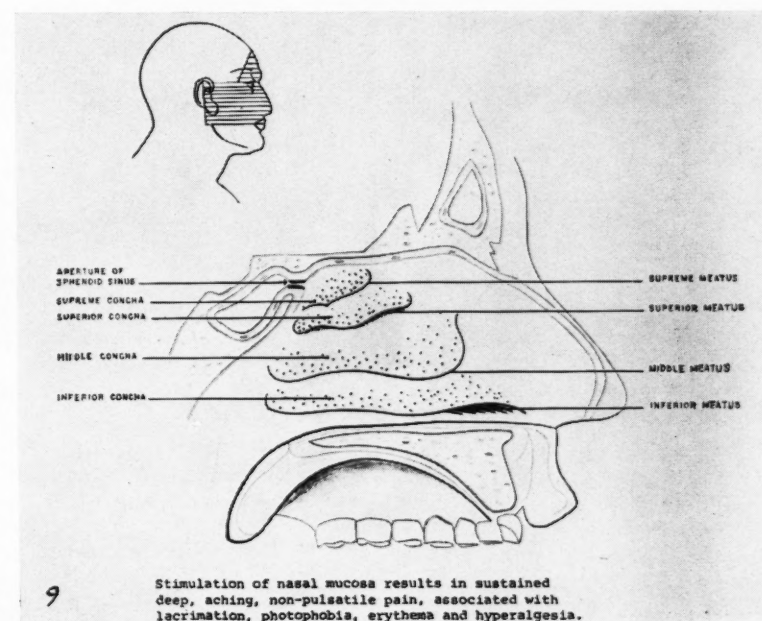
5. Peripheral nerve and specific nerve endings for pain

6. Vascular

Comment

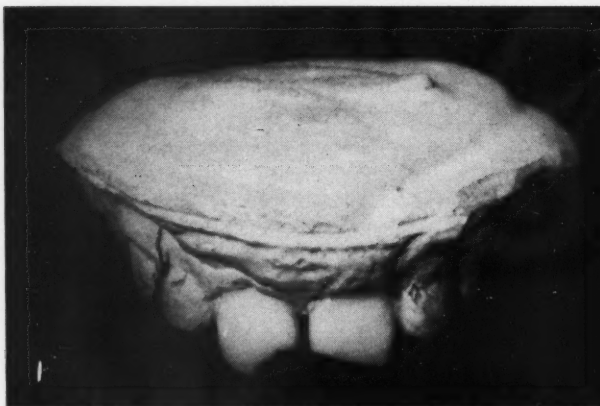
The classification that has been presented has many defects but makes possible a rational approach to diagnosis and therapy.

Adapted from *Postgraduate Medicine* 27:756 (June) 1960.

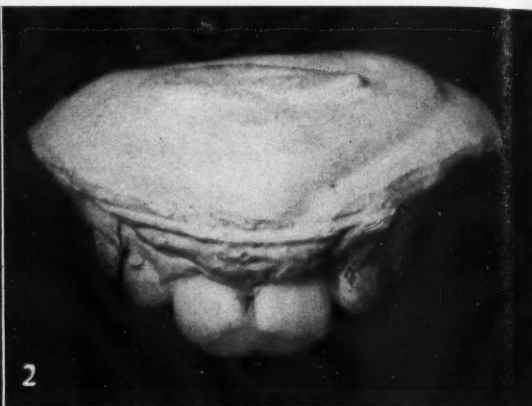


9.

Stimulation of nasal mucosa results in sustained deep, aching, nonpulsatile pain, associated with lacrimation, photophobia, erythema, and hyperalgesia. Pain is referred mainly to the second division of the fifth cranial nerve.



1.
Model with fractured teeth implanted in position.



2.
Model showing fractured portions built in with self-curing acrylic.

The Self-curing Acrylics for IMMEDIATE REPLACEMENTS

EDWIN T. JIPP, D.D.S.,
Blair, Nebraska

DIGEST

This article describes the step-by-step procedure used in the construction of an immediate acrylic bridge.

Problem

The patient was a youth of 16 who had fractured both centrals above the gingival line (Fig. 1). For esthetics it was decided to replace the fractured teeth with a metal-porcelain bridge.

Procedure

These steps were completed:



3.
Top, master model. Bottom, colloid impression.

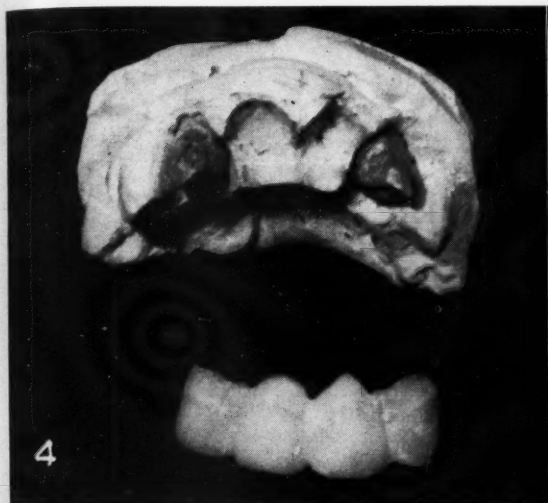
1. The lost portions of the fractured teeth were rebuilt with self-curing acrylic (Fig. 2).

2. A colloid impression was taken and a stone model made (Fig. 3). The purpose of the master model is to pro-

vide the means to obtain a colloid impression when needed.

3. Under local anesthesia the centrals were removed and preparation of the laterals was begun.

4. When sufficient space was ob-



4. Model showing partial preparation for finished case. The temporary bridge.

5. Master model showing six-tooth anterior bridge in position, and 8-tooth acrylic (temporary) bridge, worn while gold porcelain bridge was being constructed.

6. Metal and porcelain bridge finished and in place.

tained to allow crowns on the abutment teeth without obstructing occlusion the bridge was placed in position.

Bridge in Position—This phase was completed in the following manner:

1. The colloid impression was completely filled with acrylic (an excess is desirable) and placed in position with a wriggling movement to be sure it was properly seated.

2. In approximately 4 minutes the tray was removed from the mouth and the bridge was trimmed where necessary. It is rarely necessary to polish the bridge.

Concluding Steps—The case described here was set with Dura-Seal®; zinc oxide and eugenol can be used if

preferred. At subsequent appointments the abutment preparations were completed; when the mouth was healed the permanent bridge was constructed.

Advantages—At no time was the patient without teeth, and more important, the ridge was allowed to heal. When it is necessary to replace a tooth that has been previously extracted, a wax tooth can be carved in the mouth (or a denture tooth can be waxed in) and a colloid impression taken.

Extension of Fixed Bridge

The self-curing acrylics have also been found extremely helpful in ex-

tending a fixed bridge when it becomes necessary to extract the existing abutment teeth. Figure 5 shows a master model of a six-tooth anterior bridge which was completed in the following manner:

1. Since both cuspids were to be removed, reconstruction of the restoration, adding two pontics and the new abutment crowns, would take some time. After the bridge was removed from the mouth, the cuspids extracted, and the abutment teeth prepared, the colloid impression was overfilled with self-curing acrylic and placed in the mouth. The patient was dismissed.

2. At the next appointment the abutment preparations were finished and the necessary impressions taken.

3. When the case was completed the temporary bridge was removed and the new one set.

Comment

The principal value of this procedure is that during treatment the patient is able to continue an active social and business life.

Blair, Nebraska

The INCISAL RELATIONSHIP

in the Human Dentition—Part Two

Captain HENRY A. COLLETT (DC) U.S.N., Ret., Miami, Florida

DIGEST

In this installment, which is the second of a two-part article on the subject of the incisal relationship, the author discusses specific methods of modification of deep overbite in cases where this appears to be the desired approach.

Problem of Modification

The fact that 46 per cent of the patients observed in this survey^{1,2} presented an overbite so deep that ideal distribution of occlusal stress was impossible, inspires several questions: Should an attempt be made to change this relationship? If so, under what conditions should treatment be undertaken and what techniques should be used?

Symptoms not Always Manifest—Modification is not always desirable; for instance in the young patient with no periodontal deterioration modification is not indicated, nor in patients who do not exhibit symptoms.

Balance may be Established—There may be a biologic balance between the tissues of the temporomandibular joint, the muscles of mastication, and the tissues supporting the teeth, although many patients with the same type of incisal relationship do exhibit symptoms which may or may not be associated with the loss of teeth or damaging habits affecting the dental arches.

Equilibrium may be Destroyed—If

additional exogenous problems are added to this type of occlusion what otherwise might be a physiologic state of equilibrium may be destroyed.

Complete Dentures

The presence of a deep overbite presents a difficult problem in the construction of complete dentures. Before the advent of present day esthetic materials, in an effort to hide unsightly base materials occlusal schemes were constructed with little overbite. In addition much of the shearing force that seems to accelerate resorption and breakdown of the supporting tissues, especially in the anterior maxillary region, was eliminated. The modern trend seems to be toward esthetic qualities since the materials are available to accomplish this objective. Esthetic considerations are, to some extent, a matter of individual taste or temperament and often reproducing the patient's original contour and function does not always accomplish the most enviable results. Discussions on this subject might be more philosophic than scientific. When some of the presented ideas for accomplishing esthetics by restoring natural form and relationship are practiced, other advantages such as longer preservation of the supporting tissues may be sacrificed.

Modification of the Incisal Relationship

It seems desirable to consider a modification of the deep overbite when there is evidence of periodontal breakdown, especially in the maxillary incisors, when this breakdown can be attributed (1) to excessive horizontal occlusal stress, or (2) when a prosthesis exerts excessive horizontal

force on its supporting tissues. A prosthesis may exert excessive horizontal force if the labial surfaces of the mandibular incisors contact initially the lingual surfaces of the replacement maxillary incisors defectively during the mandibular excursions. This is even more damaging if the mandibular incisors are natural teeth.

Continuous Eruption and Vertical Retention of Natural Teeth

This reduction in a deep overbite can be accomplished by several methods. In any of the methods chosen the most important thing to keep in mind is the continuous eruption of teeth. A number of forces combine to maintain the natural teeth in position. If any one of these forces is removed or modified and not replaced by a substitute force, the treatment is not only likely to fail, but may be more damaging than the original condition.

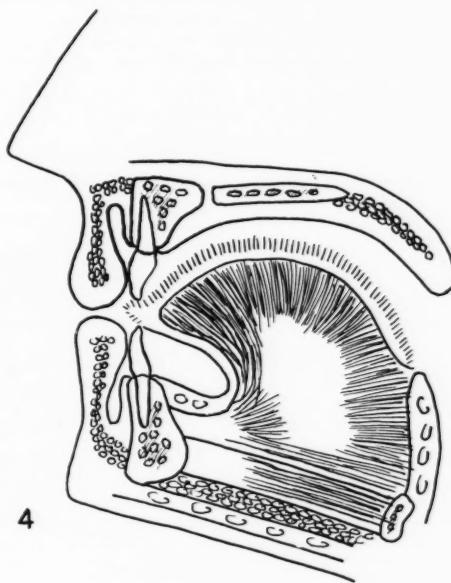
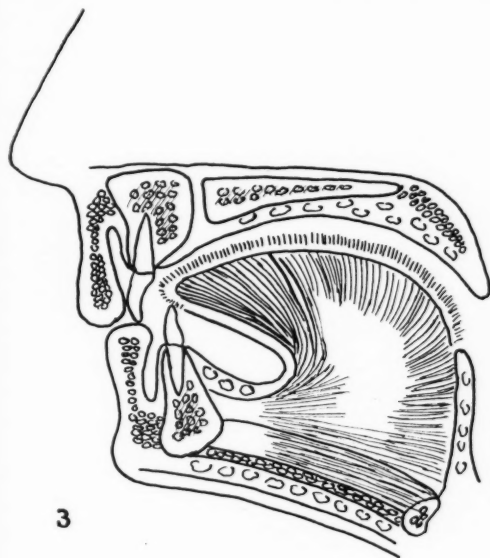
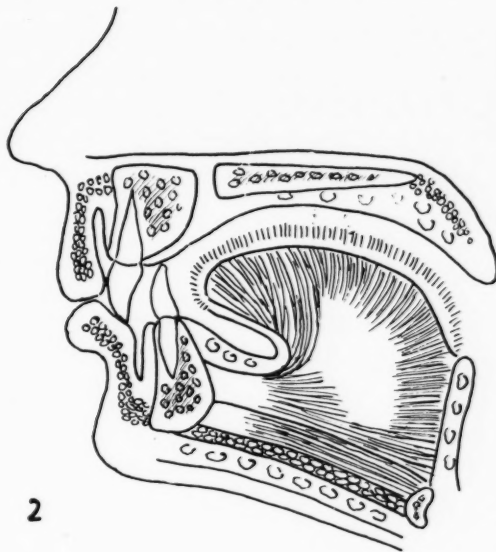
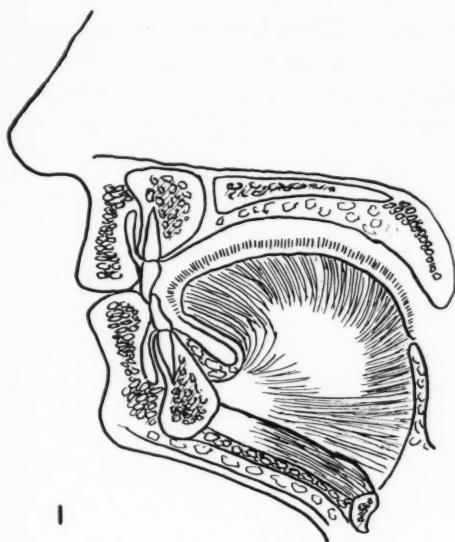
Origin of Retaining Forces—Usually the retaining forces come from the lips, tongue, from contact with approximating teeth, and from occlusal contact (Figs. 1, 2, 3, and 4). In most patients in occlusal contact, the incisal edges of the mandibular anterior teeth occlude with some part of the lingual surface of the maxillary anterior teeth. This occlusion retains the teeth in their vertical position. If this occlusion is relieved, nature will try to re-establish it through the process of continuous eruption.

Retaining Force Must be Kept—The fact that the patient is able to establish incisal contact in a protrusive relationship is insufficient. This occlusion *must* be kept in centric position if it was present in centric position before treatment, or some other suitable retaining force must be substituted for it.

Author's Note: The opinions or assertions contained in this article are those of the author and are not to be construed as official or reflecting the views of the Navy Department or the naval service in general.

¹Collett, Henry A.: Incisal Relation of the Human Dentition: Part I, Statistical Analysis and Etiology, DENTAL DIGEST 67:17 (Jan.) 1961.

²Collett, Henry A.: Variations in the Natural Occlusion and Their Significance in the Construction of Prosthetic Restorations, JADA 40:59 (Jan.) 1950.



1. The anterior teeth are retained in their vertical relationship by the occlusion of the incisal edge of the mandibular incisors with the lingual surface of the maxillary incisors. If this relationship is disturbed there is likely to be extrusion or exfoliation of the anterior teeth.

2. Extrusion or exfoliation in this relationship is prevented by pressure of the lower lip on the incisal edges of the maxillary teeth and contact of the mandibular anterior teeth with the tissue of the hard palate.

3. The incisors are retained in their vertical relationship by the pressure of the tongue and the lower lip.

4. This open bite relationship is caused by tongue biting.

Vertical Retention Provided—In some cases, especially some of the deep overbite relationships accompanied by considerable overjet (which includes about nineteen per cent of the patients observed in the survey¹) na-

ture has provided for the vertical retention of the anterior teeth in some way other than occlusion with the opposing teeth. Upon careful examination of these patients, it will be found that the continuous eruption process

of the anterior teeth is prevented by their relationship to the lip, tongue, or palate (Figs. 5 and 6). There is always some force opposing the process of continuous eruption. Here again if that force is interfered with excessive-



5. Note that the patient's tongue lies over the incisal edges of the mandibular incisors retaining them in their vertical relationship and preventing extrusion and exfoliation.

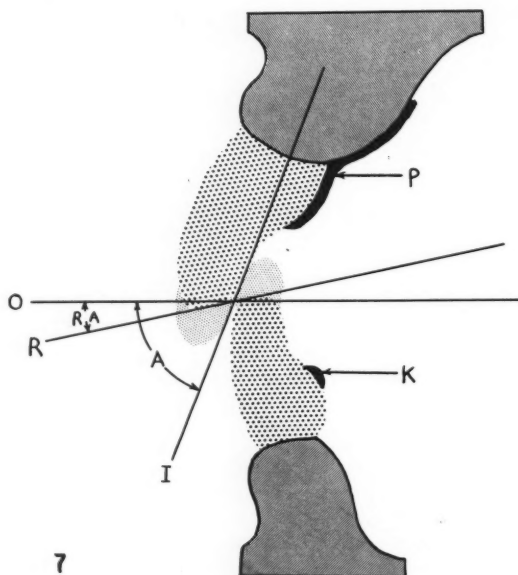


6. This is the patient shown in Figure 5 illustrating how the incisal edges of the maxillary teeth rest on the lower lip, to prevent their extrusion or exfoliation. See Figure 3.

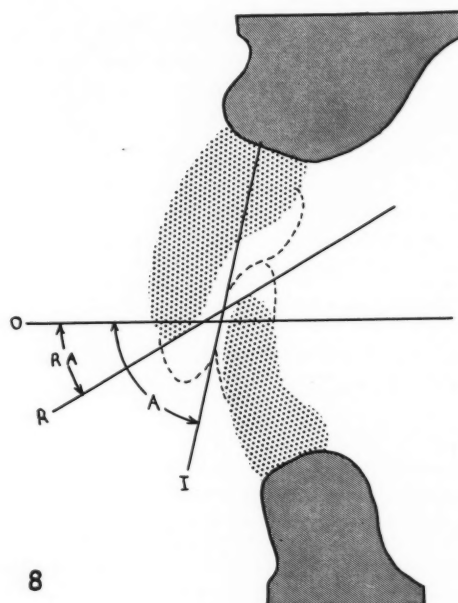
ly in treatment it must be replaced or another retaining force must be substituted to take its place. If this is not done the effects of treatment will be

temporary because the process of continuous eruption will cause a recurrence of the deep overbite. If this occurs through exfoliation rather than

extrusion of the teeth less supporting alveolar bone will be left than was present before treatment was begun.



7. Diagrammatic sketch of methods of retention used to prevent the process of continuous eruption of teeth. In the illustration parts of removable dentures are used as retainers. O: Occlusal plane. I: Original incisal relationship. A: Original angle of incisal relationship with the occlusal plane. P: Removable lingual plate. K: Kennedy bar. R: Reduced incisal relationship. RA: Reduced angle of incisal



relationship in relation to the occlusal plane.

8. Diagrammatic sketch showing method of reducing the angle of incisal relationship by increasing the occlusal vertical dimension. O: Occlusal plane. I: Original incisal relationship. R: Reduced incisal relationship. A: Original angle of incisal relationship with relation to the occlusal plane.

Techniques for the Alteration of Deep Overbite

Several possibilities may be considered if it is planned to alter a deep overbite relationship (Figs. 7 and 8).

(1) The incisogingival dimension of the maxillary crowns might be reduced. (2) The incisogingival dimension of the mandibular crowns might also be reduced. (3) The vertical dimension might be increased. Any of these methods will reduce the overbite, making the problems of occlusal stress distribution of the anterior teeth less difficult; each method, however, presents difficulties, which if not properly solved, could lead to serious complications.

Simple Method of Relief—If the incisal edges of the mandibular incisors occlude with the lingual surfaces of the maxillary incisors, the simplest method is to raise the incisal edges of the maxillary incisors, by reducing the incisogingival dimension of the crowns. This might be accomplished by simple grinding. The maxillary incisors will not be taken out of occlusion with the mandibular incisors so that extrusion or exfoliation will not result. If this method is not accompanied by some form of restorative dentistry, however, the teeth may be left uncomfortably sensitive.

Vertical Retention Must be Adequate—Where the incisors are not in occlusion with each other, but are retained in their vertical position by the lip, tongue, or palate (Figs. 5 and 9) the type of treatment just described may involve difficulties. For instance if the maxillary incisors are not in occlusion with the mandibular incisors, but are retained in their vertical position by their contact with the lower lip (Fig. 5), if the incisogingival dimension is reduced, the relationship with the lip may be changed so that the teeth no longer have sufficient vertical retention. Consequently, they may ex-



9.

The incisors are retained in an open bite relationship by the habit of tongue biting. This habit either prevents the incisors from erupting to their normal position or causes them to intrude, resulting in an open bite malocclusion. It is probable that if this relationship were disturbed (for instance, by restoring the teeth with jacket crowns) without correcting the tongue habit, that a recurrence would take place because the pressure of the tongue would cause the teeth to intrude.

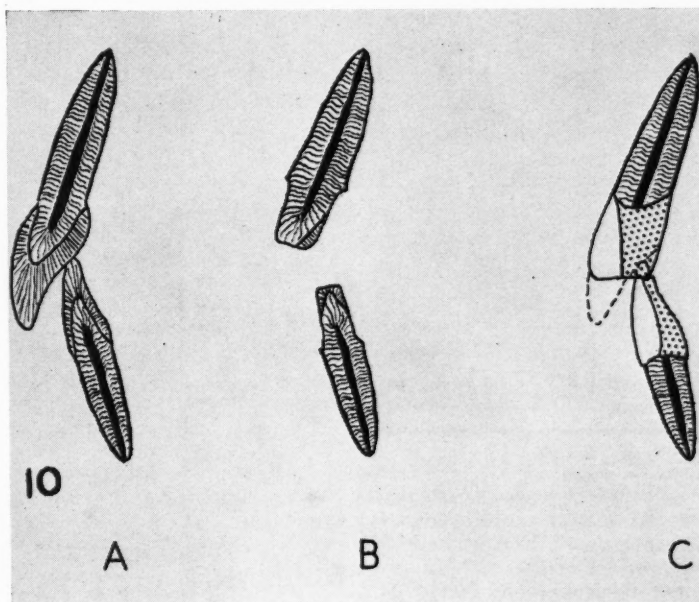
trude or exfoliate; possibly with a further loss of alveolar bone.

Alternative Method—Reducing the incisogingival dimension of the crowns of the mandibular incisors might also be accomplished by simple grinding. In this situation also if the natural vertical retention is interfered with extrusion or exfoliation can be

expected. This procedure must be accompanied with some method of mechanical retention, to prevent possible extrusion or exfoliation.

Vertical Retention of the Incisors

Vertical retention of the incisors after changing the overbite relationship



10.

Retaining the incisors in their vertical relationship after correcting the incisal relationship. A: Natural incisal relationship. B: The teeth prepared to receive crowns. C: Crowns designed to prevent extrusion or exfoliation.

11.

Changing the incisal relationship as part of a rehabilitation treatment of a periodontal condition.

can be accomplished in several ways:

- (1) By placing crowns or three-quarter crowns on the maxillary incisors modifying their lingual anatomy to restore the occlusion (Figs. 10 and 11).
- (2) They might be retained by splinting the six anteriors with crowns or three-quarter crowns soldered together at their contact points. With this method, occlusion might be necessary only on the cuspids on each side, as the splinting will retain the incisors.
- (3) A less satisfactory method of vertical retention is the use of a continuous lingual rest or Kennedy bar, associated with a removable partial denture (Fig. 12). It should be placed on or over the cinguli of the teeth.

Use of Kennedy Bar—Dentures have a tendency to settle (especially if they are the distal extension type). As the saddle settles because of resorption of the supporting tissue, the rests supporting the denture act as a fulcrum (around which the denture rocks lifting the Kennedy bar from the lingual surfaces of the teeth) which must be retained vertically. While this type of vertical retention may prevent extrusion or exfoliation, other methods sometimes provide a more permanent result.

Increasing the Occlusal Vertical Dimension

Reducing the overbite by increasing the occlusal vertical dimension should be approached with a degree of caution (Fig. 8). The patient's rest vertical dimension and freeway space are extremely important considerations in this approach. Some deep overbite patients present considerable freeway space, perhaps due to unerupted posterior teeth, or conversely they may present a limited freeway space and



normally erupted posterior teeth, depending on the etiology of the deep overbite. If the occlusal vertical dimension is to be increased at all it must be done within the freeway space. Even this precaution does not make the procedure entirely safe.

Cause of Extended Freeway Space an Important Factor—The etiology of what seems to be a more than adequate freeway space must be studied. Did the balance between the muscles of mastication, the hyoid muscles, and the posterior muscles of the neck and back prevent further eruption of the posterior teeth? If they did (which is likely) and the bite is raised the occlusal pressure which originally re-

tained the posterior teeth in their established vertical position will be increased, causing an intrusion of the posterior teeth.

Deterioration May Occur—This will tend to reestablish the occlusal vertical dimension to the position that existed before an attempt was made to change it. In this case periodontal breakdown can be expected.

Extensions Must be Prevented—Increasing the occlusal vertical dimension also presents the problem of loss of occlusal contact of both maxillary and mandibular incisors. The prevention of their extrusion or exfoliation must accompany this bite-opening procedure.



12.

A less satisfactory method of retaining the incisors in their vertical position is with the use of a Kennedy bar or a lingual plate. This method might be used with a complete maxillary denture.

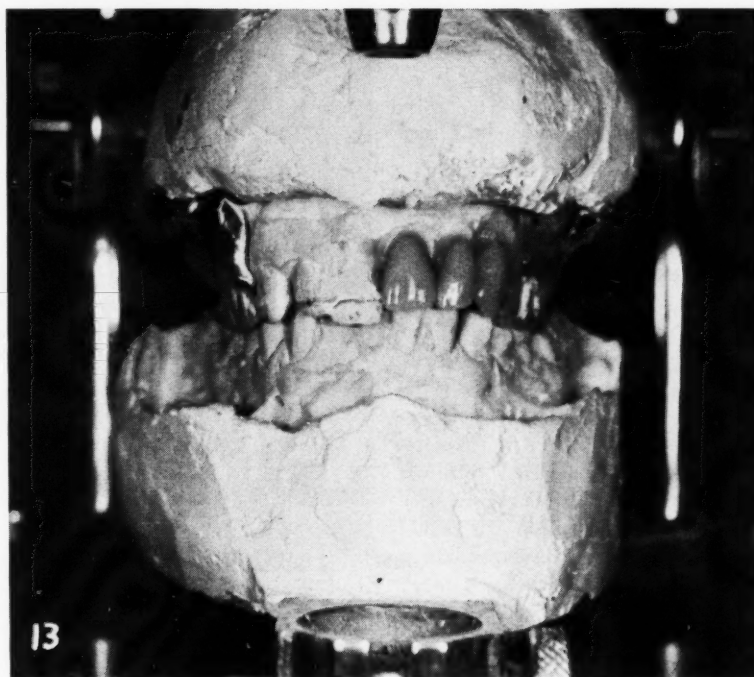
13.

Modifying the incisal relationship in the construction of an immediate denture will help preserve the denture-supporting structures of the maxilla. Some modern concepts in esthetics recommend against this type of modification.

Partial Denture Design

A number of problems in partial denture design are involved when a deep overbite is present: (1) the support of the denture, and (2) the distribution of the horizontal forces of occlusion. These problems are magnified when the maxillary denture is in question.

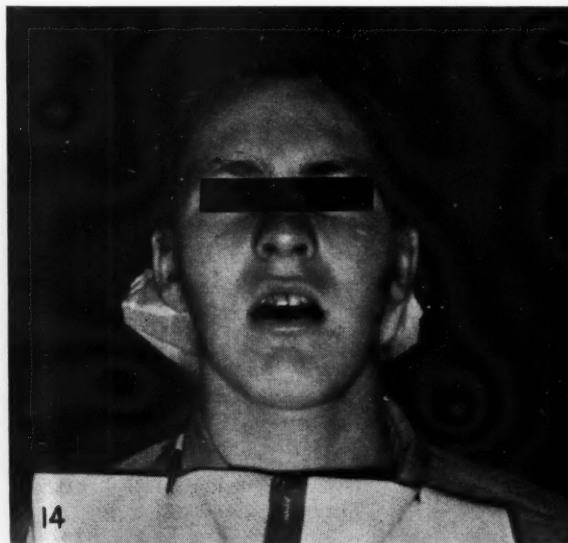
Difficulties of Support—It is often necessary to support the maxillary denture on a cuspid or incisor. When a deep overbite is present there is the problem of sufficient space for the clasp and rest. This is notably true when the labial surface of the mandibular cuspid or incisor occludes with the lingual surface of the maxillary cuspid or incisor. In this case it is extremely difficult to prepare the maxillary cuspid to receive the supporting rest. As a result many of these maxillary partial dentures are constructed



with inadequate vertical support. This shortens the life of the supporting tissues.

Lingual Inlay to Transmit Force—A distal incisal notch on a supporting cuspid will give fairly adequate ver-

tical support, but will create an esthetic problem. A lingual inlay prepared to transmit the force with the long axis of the abutment tooth will have to be made deeper than average so that the rest may be constructed strong



14. The patient's natural teeth before modification of the incisal relationship in the construction of an immediate denture. Note how short the lip is in relationship to the incisal edges of the maxillary teeth. This is the same patient illustrated in Figure 13.



15. The same patient shown in Figure 14 with the incisal relationship modified in conjunction with immediate denture treatment. Modern esthetic concepts might criticize this change in relationship; however, it is felt that this modification of the occlusion will cause less change in the supporting structures of the maxillary denture.

enough to support the vertical component of the muscular force without interfering with the occlusion.

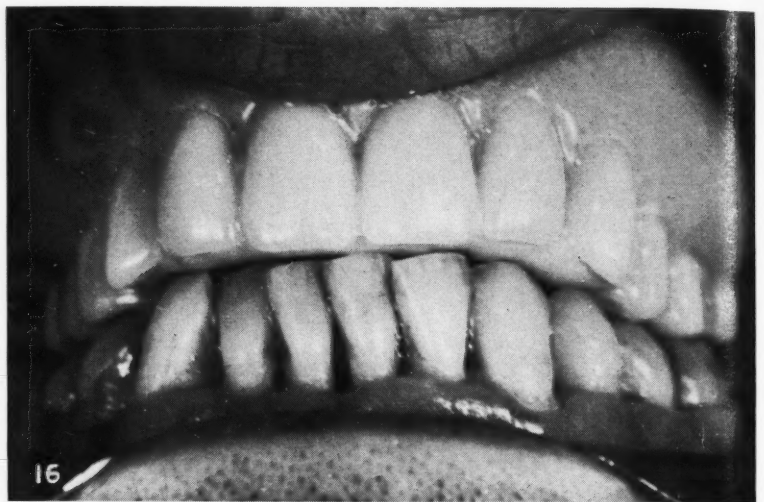
Distribution of Horizontal Forces—Distribution of the horizontal forces of the maxillary partial denture when the incisal edges of the mandibular incisors are close to or in contact with the soft tissue of the palate will in many instances preclude the use of a lingual plate or a continuous lingual clasp on the lingual surfaces of the maxillary incisors for adequate stress distribution.

To Obtain Adequate Stress Distribution—In these cases, it is necessary to splint the abutment teeth with one or more proximating teeth, each unit is then given the strength of a multi-rooted tooth. Because this procedure is time consuming and expensive, there is often a tendency to neglect it, with the result that the life of the partial replacement and the abutment teeth is shortened.

Complete Maxillary Dentures with Natural Mandibular Teeth

A deep overbite presents another problem in the replacement of the maxillary teeth with a complete denture when the mandibular anterior teeth still remain. It would seem that deep overbite should be reduced in these cases to prevent excessive horizontal forces, engendered when the mandibular incisors contact the lingual surfaces of the maxillary replacement incisors during the excursions of the mandible (Figs. 13, 14, and 15). In these cases it is frequently found that the patient has a short upper lip in relation to the incisal edges of the maxillary incisors; consequently the problem from an esthetic standpoint is not usually as difficult as it appears at first.

To Retain Vertical Position of Natural Teeth—It is extremely important to retain the remaining natural teeth in their vertical position. The simplest,



16.

Extending the denture base lingually behind the incisor teeth to occlude with incisal edges of the mandibular teeth will prevent their extrusion or exfoliation.

but least satisfactory method of accomplishing this is with the aid of a Kennedy bar or lingual plate, resting on the lingual surfaces of the teeth that are to be retained (Fig. 12). If the partial denture is of the distal extension variety, when it settles as a result of tissue resorption, the Kennedy bar or lingual plate will be lifted from the teeth as the denture rolls around the fulcrum line on the supporting rests.

Alternative Method—It is obvious that this method could not be used if the patient possessed a full complement of mandibular teeth; such a patient would have no need for a mandibular denture. A better method in all cases (for those with and without a mandibular partial replacement) is to build up the denture base just lingual to the maxillary incisors so that it will occlude with the incisal edges of the mandibular incisors in the centric occlusal position. This will prevent the extrusion or exfoliation of the opposing incisors (Fig. 16).

Disadvantages of Method—This method like most of the others, how-

ever, is not without criticism. If resorption takes place in the posterior region of the denture-supporting area before it takes place in the anterior region, it will result in a premature contact in the anterior area, perhaps resulting in a traumatic breakdown and more rapid resorption. This, of course, could be prevented by adequate service involving occlusal equilibration.

Summary and Conclusion

Deep overbite interfering with the horizontal excursions of the mandible may cause unfavorable symptoms in some patients.

This relationship can be changed somewhat by operative and prosthetic procedures to provide relief of the horizontal stresses causing the unfavorable symptoms.

There are certain precautions to be taken when attempting this type of treatment. Among them are changing the vertical relationship of the maxilla and the mandible and the vertical retention of the teeth treated to prevent extrusion or exfoliation.

555 South West First Street

The EDITOR'S Page

WHENEVER a dentist is confronted with the degenerative type of periodontal disease (periodontosis) in a young person he experiences a sense of hopelessness. Despite his skills and efforts the dentist knows that there is little that he can do to prolong the retention of the teeth.

The teeth in these cases may be beautiful in appearance; frequently there is no marked inflammation of the gingiva. When the teeth begin to migrate and the x-ray shows severe destruction of the supporting bone there is no treatment that is effective.

What causes periodontosis? No one knows. There are multiple factors. That is not a specific answer, because we have no exact information on the subject. We can use high-sounding words that are indefinite: genetic factors, constitutional inadequacy, metabolic disturbance, nutritional deficiency, endocrine imbalance. These all represent possibilities, but the exact mechanism whereby any one or a combination of these systemic conditions operates is unknown.

Held¹ of the University of Geneva uses the expression *biologic branding*. This means that the periodontium is "sensitized to the multiple possibilities of exogenous and endogenous traumata which may intervene later on."

What are some examples of *biologic branding*?

"There is the racial component. The southern European (short, dark skin, brown eyes) is more susceptible, according to Held, to "generalized paradontolyses" than is the Northern European (taller, lighter skin, blue eyes). "Heredity," Held states, "is implicitly linked to the race factor, and . . . in certain races paradontolyses . . . represents an heredity character."

There is the matter of custom. Where breast feeding is common greater suckling effort is required. This fundamental stimulation during tooth development may ensure a better developed periodontium. "... observations have shown that in the absence of a functional stimulation during tooth eruption, the structural development of the parodontium is deficient and ultimately leads to . . . factors leading to paradontopathies."

The whole broad spectrum of systemic conditions

listed by Held may somehow be related to periodontal disease: nutritional deficiency (vitamin C and protein); endocrine disturbances (lack of insulin, lack of other hormones); blood dyscrasias (leukemia, anemia, agranulocytosis); digestive tract affections (hepatic insufficiency, enteritis, colitis).

To compound the confusion Held makes this statement: "Let us now examine the circumstances in which a branded periodontium prone to involution can be affected and altered by general factors. Although the observations reported in the literature are hardly in agreement, frequently even contradictory, we may at least say:

"(1) We do not know of a single general metabolic disturbance or of a nutritional disease in which paradontopathy is observed as a constant symptom.

"(2) Numerous generalized diseases may be accompanied by paradontopathies.

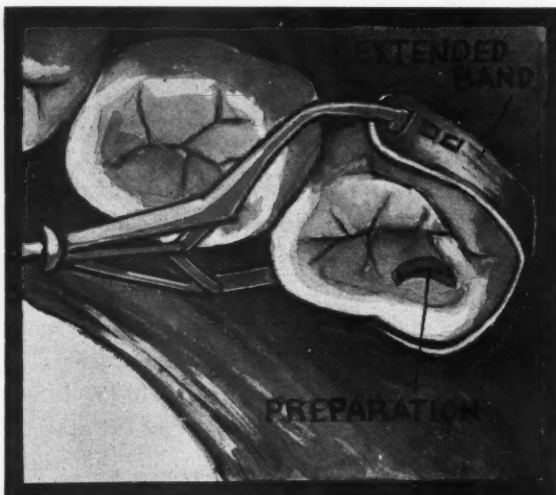
"(3) When the paradontopathy is accompanied by bone resorption (parodontolysis), the starting point of the process can be situated in three different regions: the gingiva (inflammatory origin), the bony alveolar crest (degenerative origin or bone involution), the desmodont (desmodontal degenerative origin)."

This statement means one thing: there may be some relationship, and there often is, between general disease and periodontosis. Unfortunately, we do not know the nature of such a relationship.

So far as treatment is concerned Held recommends all the standard, local procedures and offers nothing new except two words: *reactivation* and *consolidation*. Reactivation appears to mean stimulation of the local circulation by "brushing, massage, masticotherapy, application of concentrated solutions of sodium chloride, and general physical exercise." *Consolidation* presumably means restoring "the biologic equilibrium of the organism." *How* that is accomplished is not explained.

A philosophy of disease must precede research; a hypothesis comes before an experiment. The next important step in research on periodontal disease should be made in medical centers where thousands of people with systemic diseases are seen. This kind of research must be done by a combined attack made by dentists and physicians.

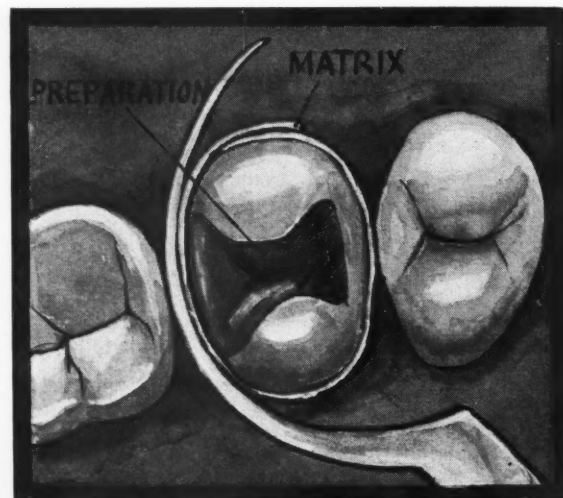
¹Held, Arthur-Jean: Background of the Approach to the Systemic Treatment of Periodontal Diseases, *Parodontologie* 14:1-9 (May) 1960.



1



2



3

Clinical and Laboratory

Amalgam Restorations

Earl S. Gilchrist, D.D.S., Indianapolis, Indiana

1. A No. 8 Ivory matrix band placed on the distal of an upper second molar acts as a backstop when condensing an occlusal amalgam in that tooth.

Marking X-rays for Comparison

James A. Raecker, D.D.S., Waterloo, Iowa

2. Clip a corner from the bitewing x-ray film to mark it for comparison purposes. The film with one corner removed is the newest. The films may be stored unmounted in an envelope.

A Matrix Wedge

A. A. McLean, D.D.S., Memphis, Tennessee

3. A No. 3 sickle-shaped explorer may be used as a wedge to adapt a metal matrix to the gingival margin.

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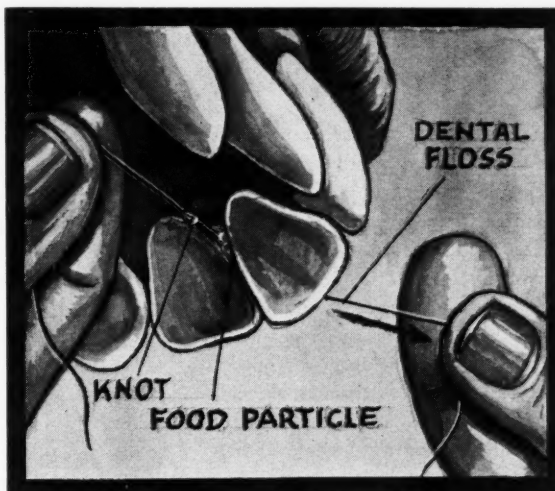
You do not have to write an article. Furnish us with rough drawings or sketches, from which we will make

SUGGESTIONS . . .

An Oral Hygiene Adjunct

David Waldman, D.D.S., Flushing, New York

4. A small knot made in the dental floss is helpful to dislodge food that is lodged between teeth.

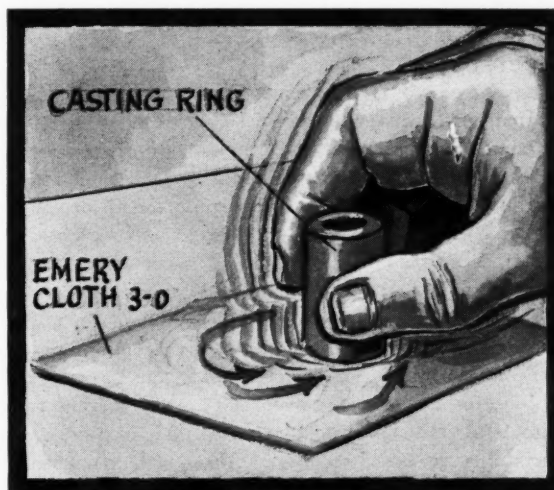


4

Refacing Casting Rings

William D. Taylor, D.D.S., Battle Creek, Michigan

5. Casting rings that are used in vacuum investment techniques must seal accurately against the sprue base. Rings may become rough from repeated heating. To assure a smooth flat surface rub the ring on a piece of emery cloth-30.



5

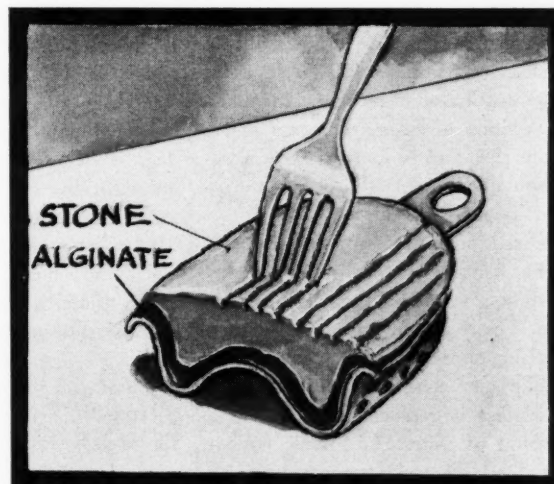
Retention Markings on Stone Models

Paul Friedman, med. dent., Geneva, Switzerland

6. The alginate impression is poured. When the stone is beginning to set scratch the surface with an ordinary kitchen fork.

suitable illustrations; write a brief description of the technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time. Turn to page 92 for a convenient form to use.

Send your ideas to Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.



6



Acute Renal Failure

An acute renal failure results from tubular damage produced by renal ischemia or nephrotoxic agents. The manifestations include oliguria or anuria, axotemia, and electrolyte imbalance.

The mortality rate remains high even though the lesion is potentially reversible. Treatment is designed to support the patient through the critical period when tubular function is virtually lacking until nephron function regenerates.

The true acute renal failure comprises three stages: tubular injury which probably lasts less than an hour, oliguria and anuria (duration varies greatly but the average length is eight to ten days), and tubular recovery.

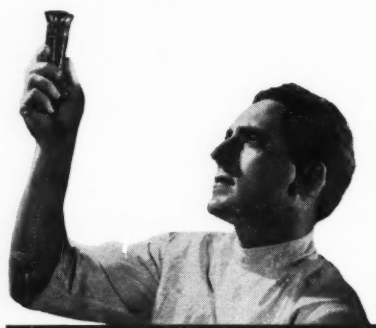
Early recognition of tubular injury is important because renal damage can be minimized or even prevented if vigorous treatment is instituted promptly. Anyone who has a shock or a transfusion reaction or ingests a foreign substance is a potential candidate.

Hypotension of any degree should be treated intensively with blood, plasma, or plasma expanders to forestall ischemia. In transfusion reactions, alkalization of the urine by oral or parenteral sodium bicarbonate may be harmful because the kidneys are incapable of excreting the sodium load. An ingested toxic substance should be eliminated from the body or rendered inactive rapidly.

The oliguric-anuric stage is most critical. Therapy should include rigid restriction of fluid and electrolyte intake, regulation of protein catabolism, prevention of excessive serum potassium rise, and support of the cardiovascular system. All fluids and calories are supplied parenterally to facilitate accurate measurement. Usually 600 cubic centimeters of liquid per day may be given safely. Up to 400 cubic centimeters per day may be added depending upon variations from the metabolic state. Urine output and other fluid loss is replaced with an equal amount of water. An anuric patient usually loses weight since adequate

MEDICINE

and the Biologic Sciences



calories cannot be supplied. Water intake should be regulated so that a weight loss of about one half pound daily occurs. At least 100 grams of carbohydrate daily is needed to diminish protein catabolism and prevent ketosis. At no time should potassium-containing substances be given. Infection, accumulations of blood, and areas of necrosis should be treated vigorously because potassium is liberated during cellular destruction.

In the recovery period, electrolytes are supplied as dictated by the serum levels and urinary excretion. Sodium and potassium depletion may result from faulty tubule cell resorption. Urine volume should be 2,500 to 3,000 cubic centimeters daily. Oral fluids are started as azotemia and nausea decrease. Small amounts of 20 percent lactose are used initially and then other fluids are added. Protein is added when nonprotein nitrogen is below 100 milligrams per cent but restricted until the level is normal. The patient is rehabilitated as rapidly as possible and renal infections are treated vigorously.

Schulz, Earl G., and Murphy, Francis D.: *Treatment of Acute Renal Failure*, *Arch. Int. Med.* **103**:453-459 (March) 1959.



Acne

Acne is a disorder of the pilosebaceous apparatus often resulting in deep-seated cystic abscesses and scarring. The importance of the disease should not be underestimated because the social and economic status of the patient is often adversely affected.

Many diversified factors produce acne. The disease is seen in patients with androgen-estrogen imbalance, in persons with oily, scaling skin, and in those using creams, grease, or oil on their skin. Bromides, iodides, sea foods, chocolate, and milk may intensify the condition. Acne is likely to flare up as a result of emotional tension. It is worse in hot, humid weather. Vitamin A deficiency and corticosteroid therapy may be precipitating elements.

In persons with a seborrheic habitus, usually adolescents, hyperplasia of the sebaceous gland occurs because of androgen-estrogen imbalance. The fluid secretions of the sebaceous gland increase in amount and become thickened. Abnormal keratinization occurs and a plug composed of jelled oil and desquamated epithelial cells is formed. Back pressure develops in the duct, the gland enlarges, and a comedo forms. The plug acts as a local irritant, infection sets in, and clinical acne develops.

The skin of the acne patient should be cleansed frequently with ordinary soap without prolonged and vigorous scrubbing. The scalp should be kept free from dandruff with frequent shampoos. No special diet is necessary, but fish, hot spicy foods, chocolate, nuts, ice cream, sharp cheese, and foods with high carbohydrate content should be restricted.

Antibiotics should be prescribed for deep-seated pustular or cystic lesions; the tetracyclines are preferred. During the acute inflammatory stage, short courses of corticosteroids may be helpful. Vaccines and staphylococcus toxoids have largely been replaced by antibiotics but are still useful in selected cases. Estrogens for ten days before the menstrual period are often bene-

ficial. Supplements of vitamins A and D are also advocated.

Topical treatment aims at producing dryness, erythema, and slight scaling. For this purpose, sulfur, often combined with resorcinol and salicylic acid in a drying lotion or ointment is applied at night. Roentgen therapy, although still useful in acne, should not be used indiscriminately. Dermabrasion or skin planing is often useful for eradicating scars. Flat, superficial scars respond better than do the deep-pitted or wide, flat, confluent scars. Those on the cheeks are more amenable than those on the back and recent scars are easier to treat than old ones.

Rattner, Herbert: Acne—The Situation at Present, Postgrad. Med. 25:446-455 (March) 1959.



Surgery in the Aged

The elderly malnourished and the elderly obese are particularly poor surgical risks. The undernourished may show no clinical or laboratory signs of avitaminosis and yet need vitamins. Also they have less glycogen reserve. Vitamins can be assured to be deficient.

In the preparation of such patients for surgery, parenteral vitamins, especially B factors and ascorbic acid are most useful. Transfusions of whole blood are recommended more freely, especially when time is important.

Aged obese patients are prone to postoperative vomiting, paralytic ileus, and pulmonary complications. Usually the operative procedure is more difficult and time consuming, placing further strain on obese patient's heart.

Good preoperative care improves morale and physical tolerance and increases self sufficiency. Deep breathing exercises and ambulation for several days prior to operation increase oxygenation of the blood and improve the general status. Morphine is not well tolerated. Scopolamine should not be given the elderly as it may cause confusion. Small doses of Demerol and atropine are preferred to preoperative sedation.

Early postoperative ambulation re-

duces complications and speeds convalescence. During waking hours, deep breathing and leg-and-foot exercise should be practiced every hour while the patient is in bed. Ambulation augments respiratory, circulatory, and intestinal function. Recumbency favors blood stagnation in the limbs and deep thrombosis. The erect position favors deep respiration, improves vital capacity, eases coughing, and helps to dislodge plugs of mucus which may cause atelectasis and broncho-pneumonia.

Operative trauma and confinement to bed in the geriatric patient may precipitate confusion and disorientation. The senile patient may be combative to the point of exhausting himself to death. A friendly attendant and dim light through the night, repeated reassurance and explanations are potent preventives. A mild tranquilizer may serve well.

Migliore, A. D.: Surgery in the Aged, J. Florida M. A. 45:1022-1024 (March) 1959.



Hospital Epidemiology

All over the world, the incidence of hospital infections by staphylococci resisting at least one antibiotic has been increased for several years. Most organisms withstand several drugs, usually penicillin, streptomycin, the tetracyclines, and sometimes, erythromycin. Phage type 80/81 strains cause explosive epidemics of the newborn and most infections among adults admitted for unrelated illness.

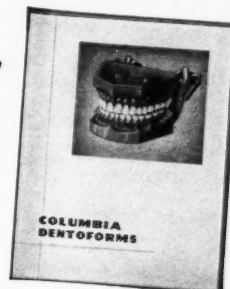
Personnel with lesions who continue to work near patients constitute the greatest transmission hazard. Infected patients, however, carriers without lesions, and fomites may also spread disease. Infection may be carried from one medical center to another. It can invade a community and become endemic.

Resistant staphylococci colonize in noses and on skin of otherwise well persons. Many infections start in large hospitals, often in a nursery where newborn infants stay more than three days. Manifestations vary from pustular

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lar dermatitis to lethal pneumonia and septicemia.

In general wards, infections begin sporadically and slowly become more frequent. Adult epidemics are often unnoticed until several grave, perhaps fatal cases develop in a short time. Carriers among hospital personnel may more than triple in number in a little more than a year. About one-third of carriers eventually have lesions, which may recur for months. Transmission probably depends more on direct human contact than on contamination by objects and materials. Larger numbers of organisms are required for infection than in some other contagious diseases.

Hospital patients and personnel may spread organisms to their families and beyond. Many infants infected in the newborn nursery become ill after going home. Nursing mothers often have breast abscesses and other relatives may have repeated boils.

The organisms may become endemic in a population having little contact with hospitals and eventually re-

(Continued on page 88)



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seed the original institution. Endemic disease may at any time cause familial and other local epidemics, but general outbreaks seem unlikely. Long-range control, however, may necessitate profound changes in hospital management, personnel training and physical design.

Return to strict aseptic techniques in nursing, medical, and surgical procedures will certainly be required. Physicians should warn patients of staphylococcal contagion and carriers in families of infected persons should be found and treated.

Verwey, W. F., and Bass, Joseph, A.: *Hospital Epidemiology, Mod. Med.* 27:88-89 (August 15) 1959.



Fatigue Fractures

Fatigue fractures occur after unaccustomed physical training. They are seen most commonly in recruits during military training. Usually the metatarsal bones are affected, but the fracture may also occur in the os calcis,

tibia, femur, and pelvis. The etiologic factor may be distraction of the bone due to repeated overstress.

Symptoms usually begin four to five weeks after the start of recruit training, often in midwinter when heavy clothing and boots are worn. Sudden trauma does not precede symptoms. A constant, dull aching pain in the impaired bone is relieved by cessation of weightbearing. When the fracture is in the pelvis, pain is often in the perineum and is aggravated by forceful abduction and adduction of the thighs. With fracture of the os calcis, pain is produced by compression of the lateral or plantar aspect of the heel. Forceful precussion of the end of a long bone or of the head produces pain in the fracture site. Point tenderness may be elicited in the area of the fracture.

Pretibial swelling often occurs when the tibia is fractured. Swelling of the ankle and foot may be noted with calcaneal or metatarsal fractures. Late in the course of disease, callus may be palpable, particularly in long bones.

Changes may not at first be apparent on roentgenograms. Films should be repeated in two or three weeks if a fatigue fracture is suspected.

In the pelvis, the fracture line is usually at the junction of the ischium and pubis. Healing may be associated with some bulging of the cortex. The femur is most commonly fractured in the lower third. Tibial lesions occur approximately 12 centimeters below the knee. Tibial and femoral fractures are accompanied by periosteal reaction for about 5 to 6 centimeters in the area of the break. An irregular sclerotic zone across the shaft may be noted at the fracture line.

Periosteal reaction is slight with os calcis fractures. Metatarsal fractures usually occur in the middle or distal thirds of the shafts of the second and third metatarsals. The fracture line is often invisible and periosteal reaction is at times the only diagnostic clue. After two weeks to one month, exuberant periosteal callus is typical.

Fatigue fractures must be differentiated from pathologic or pseudofracture due to systemic disease, benign and malignant tumors, osteomyelitis, and periostitis. The periosteal reac-

tion, age of the patient, and lack of trauma may cause confusion with bone tumors. The correct diagnosis, however, is suggested by rapid increase of periosteal reaction and appearance of a fracture line or sclerotic zone across the shaft. The efficacy of conservative therapy, obliteration of the fracture line, and solidification of the callus establish the diagnosis.

Strict bed rest for ten days usually relieves pain. Then ambulation is allowed according to the amount of pain. Most patients can resume limited duties after a month and can return to training in six to eight weeks.

Wang, C. C.; Lowrey, G. W.; and Severance, R. L.: *Fatigue Fracture of the Pelvis and of Lower Extremity, New England J. Med.* 260:958-962 (May) 1959.

Asymptomatic Enlargement of the Parotid Glands

STEVEN BORSANYI, M.D., and
CYRUS L. BLANCHARD, M.D., Baltimore

Painless enlargement of the parotid glands was studied in 21 patients in whom this condition was associated with the clinical signs of hepatic cirrhosis and a long history of alcoholism. In no case was any other salivary gland involved. Sialography, parotid biopsy, and measurement of the resting rate of salivary secretion were performed in each case. This differential diagnosis is valuable after specific parotid diseases have been ruled out in directing attention to a certain group of conditions including latent diabetes, liver cirrhosis, and precirrhotic changes. Opinions differ as to the cause of the asymptomatic parotid enlargement but nutritional deficiency states and endocrine disorders, or both, are possible factors. Histologic changes of the parotid vary little in the different underlying diseases and are not definitely characteristic of them.

From *Journal of the American Medical Association* 174:102 (Sept. 3) 1960.



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CLINICAL AND LABORATORY SUGGESTIONS

(See page 80 and 81)

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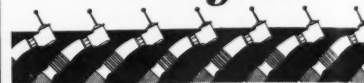
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Contra- Angles



Millions Proposed for Dentistry

A REPORT on "Dentistry in the United States" has been released. The survey on which this report is based was financed by grants of \$445,000 divided among: Kellogg Foundation, \$280,000; Rockefeller Brothers Fund, \$25,000; Louis W. and Maud Hill Family Foundation, \$5000; American Dental Association \$135,000.

The Commission that conducted the survey of dentistry was appointed by the American Council on Education. The Commission is composed of four dentists, two physicians, and ten others.

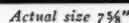
There will probably be many cases of acute hypertension among stalwart, Old Guard reactionaries in the dental profession when they read this report on dentistry in the United States and the plans for the future. This syndrome of acute elevation of blood pressure will come when the traditional arch conservatives, who have always composed the majority of the dental profession, read the proposed role that the government will occupy in the dentistry of the future: government subsidy for dental health, dental education, dental research.

To be specific on each one of these subjects here are the exact recommendations:

Dental Health—"The Commission proposes that states and communities institute plans to offer free dental inspection to all school children, with any necessary treatment to be provided by private and public agencies if parents cannot afford to pay for it. To cushion the expense of such a plan, it could be put into effect over 12 years, adding a new group of six-year olds each year . . . The Commission

(Continued on page 95)

"Since much of any future increase in research allotments undoubtedly will come from the Federal Government, the Commission is particularly disturbed at federal policy in this regard. Although the Federal Government will pay the full cost of federally financed research conducted by industry, the Department of Health, Educa-

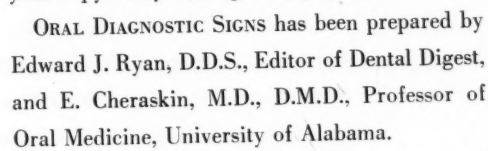


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The Commission did *not* recommend a system of compulsory health
(Continued on page 97)



insurance. The Commission did *not* recommend an extension of Social Security to include dental care. The Commission, in fact, did *not* indicate exactly where all this money was to come from. "Ways must be found" is hardly specific enough.

The low priority in which the public places dental service is well known. It is an unhappy truth that 60 per cent of our people receive virtually no dental care or receive inadequate care. The Commission states this fact and recognizes the need for extensive programs in dental health education.

The Commission is forthright in the evaluation of state licensing practices:

"All in all, the Commission finds much to be desired in the administration of licensing examinations. To an inordinate degree, tests of clinical competence too often stress mechanical skills rather than preventive and treatment procedures. Moreover, the competence of some state examiners is open to question in both theoretical and practical areas. A significant number of them are political appointees who themselves are not expert in the subject matter of the examinations they administer.

"The Commission is deeply concerned, too, that state examinations do not go beyond passing on the initial competence of a new practitioner. There is no way of ensuring that a dentist maintains his competence or that he keeps abreast of the scientific advances in dentistry that mount year by year. All states require periodic re-registration of dentists, but in no case is renewal of a license dependent upon whether a dentist has improved or even maintained his qualifications."

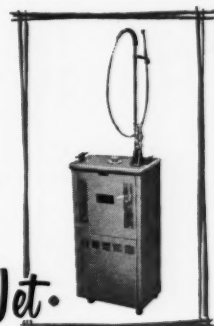
On this section on state licensing practice there is silence on the delicate subject of reciprocity that might be a method to give a better distribution of dentists.

The need for better utilization of the dental hygienist, dental assistant, dental technician is recognized and clearly stated in the report. The need for improvement in the internal affairs in dental practice (better practice administration) is also recognized.

A realistic statement is made by the
(Continued on page 98)



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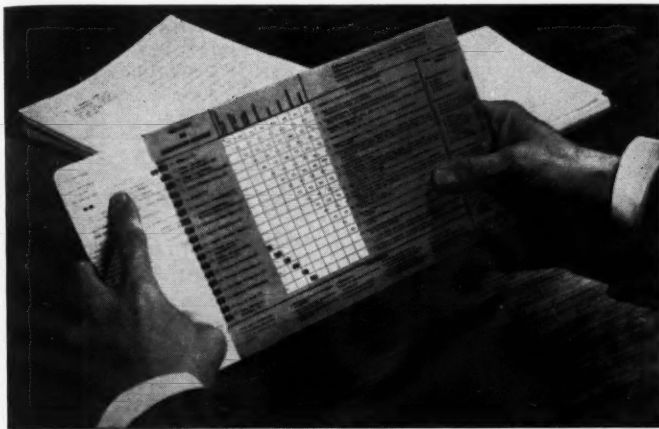
"So serious is the lag in dental research that the Commission believes the research potential of existing dental schools must be considerably expanded even before any new schools are created. An important step that should be taken in this direction is to establish closer relationships between investigators in dental schools and those in the graduate schools and other university health science schools. It would be futile to attempt this, however, until the quality and scope of science courses in the dental schools have been raised to levels acceptable to graduate colleges. At present most medical school science courses are accepted by graduate schools, but many dental school courses are not.

"One reason for this has been the tendency of universities, particularly those that are privately endowed, to count on income from dental clinics to provide significant support for their dental colleges. In order to produce income for the university, dental students are required to spend a disproportionate amount of time in the clinic rather than in the library or laboratory. Under these conditions, training in clinical skills is likely to displace scientific education and research.

"Under these conditions, too, it is almost inevitable that clinical teachers, whose leadership is necessary if students are to be drawn to research, will develop a cynical attitude toward it. At work on the clinic floor or in the technique laboratory all day long, the clinical teacher has little time or energy for academic pursuits, nor is he likely to develop much respect for them. Transmitted to his students, such a negative attitude often constitutes an almost insurmountable obstacle to the development of student interest in research."

The comparative paucity of dental research is demonstrated in the report: Although the cost of dental treatment amounts to *one-tenth* of the total health care budget only *one-fiftieth* of the amount spent on health research is allocated for dental research.

It is anybody's guess how taxpayers, lawmakers, public administrators will
(Continued on page 102)



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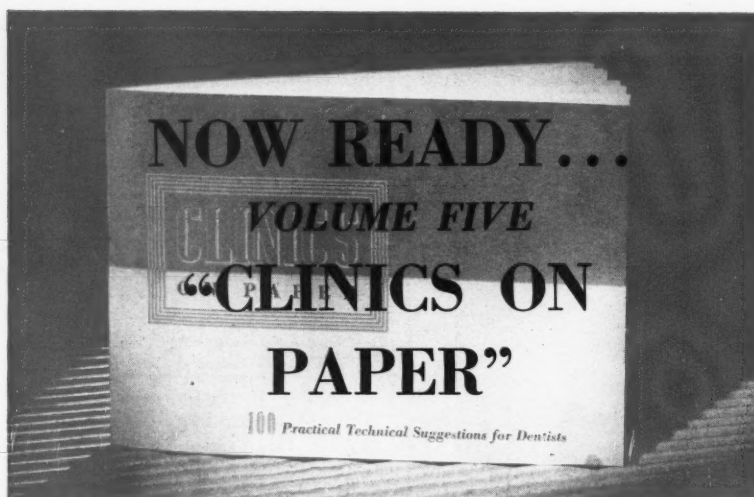
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